



Abatement and Selective Demolition

**130 Cedar Street
New York, NY 10006**

October 2006

Section 2.0 Revised December 2006

**Prepared for:
Masterworks Development Corporation
56 West 45th Street, 4th Floor
New York, NY 10036**

Prepared by:
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1.0 Cover Letter



October 31, 2006

Mr. Pat Evangelista
U.S. Environmental Protection Agency
290 Broadway, 24th Floor
New York City, NY 10007

Dear Mr. Evangelista:

Enclosed are the formal specifications related to planned abatement and selective demolition of the building located at 130 Cedar Street, New York, NY 10006 ("the Building") and adjacent to the World Trade Center site in lower Manhattan. Masterworks Development Corporation wishes to conduct the abatement and selective demolition in a safe manner that will minimize the potential for exposure to contaminants of workers, the community, and future occupants. We ask that you review and comment on these plans so that we can make any necessary adjustments in order to comply with all government requirements.

The Building, also known as the Green Exchange Building was built as a warehouse and industrial building. The frame is heavy reinforced concrete, with flat slab solid concrete floors, designed to take a load of 200 lbs/ft². The planned use, a hotel, has much lighter floor loading requirements. The Building has large, wide concrete columns at the perimeter, which are generally clad in brickwork. Windows generally are metal frame and span from column to column and up to the soffit of the floor slab, except where they were replaced on the Albany Street elevation. The perimeter pilaster columns are clad in brick, as are the spandrel areas beneath the windows. The brick cladding is generally tight up against the concrete or terracotta block internal spandrel walls. The top of the spandrels are sealed cast concrete window sills, and the bottom is closed by the slab and metal shelf angle supporting the brick. There are no visible weeps, vents or drains.

Physical damage occurred to windows and some small areas of the Building as a result of the events of September 11, 2001 (WTC Event), with resultant intrusion of World Trade Center (WTC) dust into the Building interior. The Building was inspected, and some external areas were cleared by FEMA in 2001. They also fitted temporary electrical lighting, and temporary props to the damaged roof area, and boarded up windows, mostly on the Cedar Street elevation. All the interior furnishings, fittings, and non load bearing partitions, ceilings and floor finishes (except those containing designated materials) were removed in 2004. The interior of the Building was washed. The exterior of the Building has been washed by rains over the last five years, but we have no record of it having been systematically cleaned. The Building was fully scaffolded in 2005 and sealed as per EPA requirements progressively through 2005 and 2006. The Building is quite unlike and more simple to abate than other nearby buildings such as 130 Liberty Street or 4 Albany Street, both of which had open, vented, contaminated cavities in the external envelope.

However, there are some small areas where the impacts from the WTC Event caused the brick to become dislodged. These occur at high level on the Building (generally above level 10) and parapet level at the northern end of the Washington Street elevation. In these areas the methodology calls for sealing the cavity, providing temporary external support to the brickwork, removing the internal terracotta block wall, in total or in part, and cleaning the cavity prior to removal of the material.

Our overall strategy for performing the abatement, selective demolition, and concurrent community air monitoring, and worker health and safety oversight, and monitoring are provided in the attached documents. The overall plan may be briefly summarized as follows:

The Building has been sealed to prevent air flow from inside the Building to the exterior environment and inspected and approved by the EPA & NYCDEP. Each contained floor(s) or section will be abated under negative pressure. Compared with other buildings impacted by the WTC Event, the planned abatement activities are straightforward owing to the simple construction of the Building, previous removal of most interior walls and contents along with a general surface cleaning.

Our Waste Sampling and Management Plan calls for removal and disposal of the remaining contents of fixtures including but not limited to fluorescent light fixtures and elevator motor oil, building materials such as but not limited to lead based paint, asbestos containing materials, WTC dust, and WTC dust contaminated components or materials.

The renovation and construction plan calls for all exterior windows and facade walls except for stairwell and elevator core in the center of the west wall to be demolished, floor by floor, following abatement and successful clearance evaluation back to the concrete columns and slabs.

Any wall sections found to have an interstitial space that has been breached and appears capable of transmitting airflow though it, will be assumed to be contaminated with WTC dust will be abated and demolished in full containment.

All workers will have received appropriate training in accordance with NYSDOH and licensed by the NYSDOL and/or the NYCDEP. Abatement personnel will wear personnel protective equipment including PAPR or full or half face APR respirators equipped with P-100 filters.

The abatement and selective demolition plan calls for four exterior community air monitoring stations. Analytical results will be uploaded to the EPA within 48 hours, unless exceedances are observed, in which case, work will be halted and the EPA will be informed immediately. Work will resume once the cause has been determined and if necessary, mitigated, and after approval from the regulators. Likewise, daily worker health and safety monitoring will be performed and proper entry and exit to the work space prior to completion of abatement and successful clearance will be made through a properly maintained decontamination facility. Enclosed, please find copies of draft documents:

- 1.0 Cover Letter
- 2.0 Specification for Abatement and Selective Demolition
- 3.0 Specification for the Removal of the Building from Containment
- 4.0 Specification for Community Air Monitoring
- 5.0 Health and Safety Plan
- 6.0 Emergency Action Plan
- 7.0 Waste Sampling and Management Plan
- 8.0 Quality Assurance Program Plan

We look forward to receiving comments at your earliest convenience. If you have questions, please do not hesitate to contact me at 412-298-7648.

Sincerely,

Michael Campbell
Senior Project Manager
RJ LeeGroup, Inc.
3500 Fifth Avenue, Suite 5820
New York City, NY 10118

cc: Krish Radhakrishnan, NYCDEP
Chris Colbourne, Masterworks Development Corporation
Lech Gorecki, Laval Construction Corporation
Emmet Keveney, NYCRRRO
David Crawford, RJ LeeGroup, Inc.



December 20, 2006

Mr. Rajappan Radhakrishnan

New York City Department of Environmental Protection
59-17 Junction Blvd.
8th Floor
Flushing, NY 11373

Re: NYCDEP Clarifications to Section 2.0 of the Abatement and Selective Demolition Specification for 130 Cedar Street

Dear Krish,

Per our meeting at your office yesterday, please find enclosed Section 2.0 of the Abatement and Selective Demolition specification for 130 Cedar Street submitted to the USEPA on October 30, 2006, edited to include references to the ACP-7 & 9 submitted to your office for the same project.

The edits are as follows;

- Work area designation and applicable variances from the ACP-7 & 9 have been inserted below the specific section titles in the specification.
- An explanation of the use of the freight elevator as a conduit for the work areas to the dirty rooms of the decontamination units on the first floor was inserted in Section 2.1.
- A description & definition of spandrel wall breach type has been added to Section 1.0. The determination of the hard wall containment barrier option for each bay will be made at the same time as the Façade wash down. This is also clarified in Sections 2.2 & 2.3 describing that the scaffold plank erected for the Façade wash down will allow for inspection of the exterior spandrel walls, determination of the hard wall containment barrier option and completion of the Bay Damage Diagrams in Appendix C. Additionally, minor edits were made to the title, text and drawings of the Exterior Wall Containment Options in Appendices A & B to further clarify their construction.

- An explanation of the abatement methodology for the ACM skim coat above the hard barrier wall erected and clarified in Section 2.1 is added to Section 2.11. This is actually when the abatement will take place.
- Minor edits were made to Sections 2.2 & 2.3 to clarify the sequencing of the overlapping Phases of 1, 1A & 1B.
- The title of section 2.9 was edited to reflect all roofs to be abated.
- Per the recent request of the New York City Office of Chief Medical Examiner (OCME) to perform searches for potential human remains, this specification and been edited to include procedures to handle these searches. These edits are in Sections 1.0, 2.6, 2.7, 2.8, 2.9 & 2.10 and the addition of Appendix H.

Sincerely,
R. J. Lee Group, Inc.

Michael A. Campbell
Senior Project Manager

Cc: Tres Herndon – Laval
Chris Flavell - Nova
RJLG File

2.0 Specification for Abatement and Selective Demolition



Specification for Abatement and Selective Demolition

**Abatement and Selective Demolition
130 Cedar Street
New York, NY 10006**

**December 20, 2006
NYCDEP Clarifications**

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Specification for Abatement and Selective Demolition

1.0 Introduction

The building located at 130 Cedar Street, New York, NY 10006 ("the Building") sustained damage as a result of the events of September 11, 2001 (WTC Event), allowing intrusion of dust, smoke and debris into the Building.

Also, as a result of the events of 9/11 and more recent findings of human remains in and around the WTC Site, the New York City, Office of Chief Medical Examiner, (NYC OCME), has requested that they be allow to search certain areas of 130 Cedar St. for potential human remains. As of the editing of this specification procedures have been included to handle these searches.

Thus, the scope of work for this project is the abatement of all contaminated dust and debris (including all porous materials - paper materials and sheet rock, included - as asbestos contaminated waste), all asbestos containing materials, (ACM) and all lead-based paints located within the Building (referred collectively as "designated materials"), along with a complete containment dust abatement including certain specified dust contaminated interstitial spaces (defined below), to a level which will permit demolition workers to perform selective demolition without environmental protective equipment.

Of particular concern are the WTC Dust contaminated interstitial spaces in the exterior spandrel walls. Following is the procedure that has been and will continue to be utilized to evaluated and identify WTC Dust contaminated interstitial spaces and procedures to abate such areas under a negative pressure containment.

The exterior walls, bays between the columns and the slab above and below, at 130 Cedar St. are comprised of five general types of construction/cross section.

West Wall - Southern Third

This wall is comprised of a single layer of terra cotta tile mortared to the columns and both slabs. These walls will be removed under full containment procedures described in this specification to allow for the cleaning of the gap between 130 Cedar and 90 West St. and the 90 West St. façade.

West Wall - Stairwell & Elevator Core

This wall is comprised of an outer poured concrete wall with inner terra cotta wall mortared to it and the columns and the slabs above and below.

West Wall - Northern Third

This wall is comprised of an exterior brick wall mortared to the columns and slabs above and below and an interior terra cotta tile wall mortared to the exterior brick wall and to the columns and the slabs above and below. After the structural wall construction, a layer or layers of plaster was applied to the interior finish of the terra cotta walls. These walls will be removed under full containment procedures described in this specification to allow for the cleaning of the gap between 130 Cedar and 90 West St. and the 90 West St, façade.

North, East & South Walls from floors 4 through 12, and the bay north of the stairwell and elevator core on the West Wall

The bottom of these walls are comprised of an exterior brick wall supported by a metal shelf angle, mortared to the floor slab and the columns and an interior terra cotta tile wall mortared to the exterior brick wall and to the floor slab and the columns. These two walls are topped by a solid cast concrete cap mortared to the top of this two wall unit. This solid cast concrete cap also serves as the sill for the window assembly that makes up the remaining area of the bay from column to column and from the concrete cap to the floor slab above. After the structural wall construction, a layer or layers of plaster was applied to the interior finish of the terra cotta walls.

North, East & South Walls on floors 1, 2 & 3

These walls are comprised of a poured concrete exterior wall, a red brick spacer wall and an interior terra cotta tile wall mortared to the floor slab and the columns. These two walls and spacer are topped by a solid cast concrete cap mortared to the top of this wall unit. This solid cast concrete cap also serves as the sill for the window assembly that makes up the remaining area of the bay from column to column and from the concrete cap to the floor slab above. After the structural wall construction, a layer or layers of plaster was applied to the interior finish of the terra cotta walls.

There are no visible weeps, vents or drains in any of the wall construction types described above.

None of the wall construction types described above was engineered to have a flow of air through them; rather they were engineered to be a sealed unit to keep the outside environmental factors such as rain, heat, cold etc. from affecting the interior environment.

A visual inspection of the accessible walls units show that due to the WTC Event and the subsequent structural investigation by FEMA and others, breaches in either the interior or exterior components on these walls units have occurred. A Breach will be defined, for the purposes of this document, as any damage, crack or man-made feature that may allow air flow to the interior of the two wall unit spandrel or exterior wall. A general breach is defined as damage or breaches allowing air flow to greater than 25 percent of the interstitial space. This is especially evident on the

exterior of floors 10, 11 and 12 on the northern third of the east side and on the north side. (Appendix C). A localized breach is defined as areas of the interior spandrel terracotta wall where manmade breaches such as investigative probe locations, drill holes, sampling locations, electrical and mechanical system damaged hangers, etc. have left small breaches affording air flow to less than 25 percent of the interstitial space.

At the time of the drafting of this specification, a visual inspection has been performed on every interior bay and the exterior bays on the roof parapet, 12th, and 1st floors (See Bay Damage Diagrams in Appendix C). To date, there is no scaffold planking installed to allow for a visual inspection of the exterior bays of the 2nd to 11th floors. While performing the "exterior façade clean-up" in Phases IA & B, visual inspections of all remaining exterior bays will be performed and the "Bay Damaged Diagrams" will be updated. The façade clean-up is phased before any abatement of the bay damage areas, therefore, the information gathered during the façade cleanup visual inspection will determine the containment set-up/construction, per the procedures set forth in this specification, for the subsequent abatement phases.

Any bays found to have been damaged or breached, in general, the entire bay will be considered interstitially contaminated with WTC dust. These walls will be abated under the full negative pressure containments and procedures described in this specification.

For any bays where the interior walls are damaged or breached locally, only the localized area immediately around the localized breach will be abated under the full negative pressure containments and procedures described in this specification. This may entail, for example, drilling a 4" core hole over a 1" investigative probe or drill hole and low pressure power washing the void created by the 4" drill. All localized abatement will be performed only after all gross abatement in a given containment. This localized abatement will be the last task before the final cleanings of the containment.

Any bays found NOT to have been damaged or breached will be consider free of interstitial WTC dust and only the exposed surfaces of the wall units will be cleaned as describe in this specification. These cleaned wall units will subsequently be demolished during the demolition phase.

Removal of all designated materials during the project, therefore, shall be performed utilizing full-containment procedures as required by the New York City Department of Environmental Protection (NYCDEP) and filed under an ACP-7 form, with approved variances, plus filed with the New York State Department of Labor (NYSDOL) under ICR 56 and Federal EPA. Contractor shall file and pay all fees associated with the abatement for New York State and United States Environmental Protection Agency or other governmental authorities, and

additionally any/all other applicable city, state, or federal filings (such as New York State Department of Labor).

Final air and surface wipe clearances for each contaminant delineated herein will be performed in accordance with the Specification for the Removal of the Building from Containment.

During all phases of the project air monitoring will be performed in accordance with the Specification for Community Air Monitoring which incorporates air monitoring requirements of NYSDOL Code Rule 56 and NYCDEP Title 15. Additionally, personal air monitoring for asbestos and “target metals” delineated in the specification will be performed.

2.0 Project Phasing and Specific Procedures

2.1 Phase I: Abatement to Develop a “Clean Zone”

NYCDEP ACP 7 & 9 Work Area I-A, Variance DI

The Building is considered contaminated therefore, all work described herein will be performed in PPE as described in the HASP, by personnel who have had the appropriate medical surveillance and respiratory fit tests and by properly trained and/or licensed personnel.

Phase I abatement will be performed to establish a “Clean Zone” to construct personnel, ACM/hazardous waste, and non-porous scrap decontamination units and shanty space.

Hard walled personnel and waste decontamination units will be erected per New York City Department of Environmental Protection variance Attachment DI at the east main door access to the 1st floor. After construction, these units will be cleaned, visually inspected by the Environmental Consultant and final air clearance sampling will be performed. Upon receipt of acceptable final air results, a site inspection, and approval from the NYCDEP, these units will be utilized to abate the southern third and loading dock area of the first floor as follows:

- In bays where the exterior spandrel walls below the windows are damaged or breached and therefore are considered to be interstitially contaminated with WTC dust, erect an Exterior Wall Containment Option #1, #1A or # 2 as appropriate for abatement and demolition of the windows, window caulking, and spandrel wall into the building containment. (Appendix A or B).
- In bays where the exterior spandrel walls below the windows are damaged or breached locally on the interior terra cotta wall only and therefore are considered to be interstitially contaminated locally with WTC dust, erect an Exterior Wall Containment Option # 1A to support the exterior brick cladding, for abatement and demolition of the windows, window caulking,

and abatement and localized demolition of the interior terracotta spandrel wall into the building containment. (Appendix A).

- In bays where the exterior spandrel walls below the windows are found to be intact and not damaged or breached and therefore NOT considered interstitially contaminated with WTC dust, erect an Exterior Wall Containment Option #1B, to allow for abatement and demolition of the windows and window caulking into the building containment. (Appendix A).
- A 2" x 4" and plywood barrier covered with two layers of 6 mil poly will be erected north of the personal and waste decontamination units from the east exterior wall west to the wall of the elevator lobby.
- Erect this barrier wall from the floor to the ceiling, floor slab above. The ACM skim coat on the ceiling in the area to which this wall is to be attached will abated in Phase III-I.
- Prior to erecting the barrier wall, all floor, wall and ceiling surfaces that the barrier wall will be sealed to will be abated to a visually clean satisfaction of the Environmental Consultant then encapsulated with a penetrating encapsulant.
- The main elevator lobby will be sealed as necessary to allow for the installation of multiple HEPA units. These HEPA units will be vented to the outside of the Building through the first floor north wall, and will serve as inward airflow, negative pressure, through the personnel, ACM/hazardous waste and non-porous scrap decontamination units that will be erected once this "Clean Zone" is established. These units will not be functional until the permanent decons on the loading dock are constructed and are ready to be utilized.
- All elevator doors and frames will be HEPA vacuumed and wet wiped to visually clean satisfaction of the Environmental Consultant then encapsulated with a penetrating encapsulant. These doors will be sealed off with 2" x 4" framing and plywood, foam sealed at the edges, and covered with two layers of 6 mil poly. The freight elevator will be utilized as a sealed conduit from the active work areas and the dirty room of the main decontamination chambers on the first floor. The elevator doors will only be breached on the active abatement floors. The freight elevator shaft will be kept under negative pressure.
- The southeastern third of the first floor, the loading dock area and the main stairwell from the basement to the roof will become the first "Full Containment" that will be constructed, sealed and abated per NYSDOL Code Rule 56 and NYCDEP Title 15 utilizing only this temporary decon.

- An access through the wall dividing the main stairwell lobby and the loading dock area will be opened. Each existing access door to every floor in the main stairwell will be removed, and a temporary hard barrier with a kick out panel, foamed and poly sealed as necessary, will be erected. Each door to the men's rooms located north of each main stairwell floor landing will be sealed. These men's rooms will be abated, with each floor containment described herein, by first creating an access from the women's room into the men's room. This will allow the main stairwell to be abated, cleared and remain clean throughout the project phases. This stairwell will be utilized for access into the abatement containments for final cleaning and final air and wipe clearances utilizing individual two stage airlocks erected after gross cleaning of each abatement area.
- All double bagged waste from the gross cleaning of this area will be stored on the north side of the barrier wall for disposal after the permanent decons are constructed on the loading dock.
- Seal off any floor 1 slab penetrations to the basement and floor 2 slab penetrations to the floor 1.
- Before the final cleanings of this area are performed, the access to the elevator lobby to the north side of the floor, the temporary access from the abatement containment to the south, the "dirty area" to the north, and the access from the elevator lobby to the stairwell will be sealed. Access to the north, "dirty area" of floor 1 will be the freight elevator to the basement and up through the back stairwell.
- After the final cleanings and a visual inspection by the Environmental Consultant, final air and surface wipe clearances will be performed.
- Once acceptable results of the final clearances are obtained, Phase II can begin.

2.2 Phase I A: North, East & South Exterior Façade Clean Up

NYCDEP ACP 7 & 9 Work Area I-B, I-C & I-D, Variances EC, DI & IC

Concurrent with Phase I and I B the wash down of the North, East & South exterior façades will be performed per the Building Facade Clean Up procedure (Appendix G) issued by the NYCDEP after the WTC Event.

This work will be performed from the top of the Building down utilizing the pole scaffold surrounding the Building.

- A two stage airlock will be erected inside a door on the west end of the north side of the 1st floor for workers to enter the Building to access the temporary decon through the temporary access in the barrier wall dividing the south "Clean Zone" and the north "dirty area".

- Final cleaning and clearance of the “Clean Zone” will not be performed until the exterior façade wash down in Phases #1A & #1B are complete. Once the façade wash down is complete, the temporary access in the barrier wall will then be filled with 2” x 4” and plywood and sealed with double 6 mil poly.
- While the Environmental Consultant performs the visual clearance of the façade cleaning a determination will also be made on whether exterior of the spandrel wall is breached. Based upon this determination the Environmental Consultant will direct the abatement contractor to erect a hard walled containment barrier per the parameters set forth in Sections 2.1, 2.8 & 2.10 of this specification.

2.3 Phase I B: West, 90 West Courtyard, Exterior Façade Clean Up NYCDEP ACP 7 & 9 Work Area I-B & I-C, Variances EC & DI

Concurrent with Phase I and I A the wash down of the West, 90 West Courtyard, exterior façade will be performed per the Building Facade Clean Up procedure (Appendix G) issued by the NYCDEP after the WTC Event.

This work will be performed from the top of the building down utilizing a swing scaffold platform erected on the roof.

- The swing scaffold will be picked from Albany St. with a crane and set on the roof. The scaffold and counterweights will be erected on the 130 Cedar St. roof above the 90 West courtyard.
- A two stage airlock will be erected inside the floor 2 door to the courtyard for workers to enter the Building to access the temporary decon through the temporary access in the barrier wall dividing the south “Clean Zone” and the north “dirty area”.
- While the Environmental Consultant performs the visual clearance of the façade cleaning a determination will also be made on whether exterior of the spandrel wall is breached. Based upon this determination the Environmental Consultant will direct the abatement contractor to erect a hard walled containment barrier per the parameters set forth in Sections 2.1, 2.8 & 2.10 of this specification.
- Final cleaning and clearance of the “Clean Zone” will not be performed until the exterior façade wash down Phases #1A & #1B are complete. Once the façade wash down is complete, the temporary access in the barrier wall will then be filled with 2” x 4” and plywood and sealed with double 6 mil poly.

2.4 Phase II: Construction of Decontamination Units, Shanties & Locker Rooms No Abatement

Personnel, ACM/hazardous waste, and non-porous scrap decontamination units will be erected per NYSDOL Code Rule 56 and NYCDEP Title 15 in the "Clean Zone" with the dirty rooms connecting to the elevator lobby.

Once the decons are erected and sealed to the elevator lobby and inspected by the Environmental Consultant, the barrier at the elevator lobby will be breached and the HEPA units previously installed will be turned on to provide inward airflow through the personnel, ACM/hazardous waste and non-porous scrap decontamination units. At this time storage and office space, (shanties), and worker locker rooms will also be erected.

2.5 Phase III: Abatement Preparatory Work No Abatement

Phase III will utilize the personnel, ACM/hazardous waste, and non-porous scrap decontamination units erected in the "Clean Zone". All work areas of the Building will be accessed via the freight elevator. The main stairwell, which was cleaned and cleared in Phase I, will be utilized to access the floors for final cleaning and can serve as emergency egress with hard barrier kick out panels installed.

Previous to the drafting of this specification, all penetrations to the outside of the Building were sealed off to prevent air flow from inside to outside. This work was inspected and approved by representative of the EPA & NYCDEP.

In performing abatement on Phases IIIB, D-G, I,J (i.e., floors 1 through 12), the gap between the exterior of the Building on the west and the exterior of 90 West St. on the east, north and south of the courtyard, will need to be abated.

This gap is 6" to 8" wide and runs from the basement to the roof parapet on the south side of the courtyard and from the floor 4 to the roof parapet on the north side of the courtyard.

To prepare for this abatement, this "gap" will be sealed on all sides utilizing plywood and spray foam accessed from the scaffold surrounding the Building for the north and south side and from the swing scaffold for the courtyard sides. The tops of the gaps will have a negative pressure tent erected in Phase III A1 to demolish the roof parapet to clean the inaccessible wall of 90 West St.

2.6 Phase III A: Abatement of the Penthouse Engineer's Office, Elevator Mechanical Room & Storage Rooms NYCDEP ACP 7 & 9 Work Area IV-A, Variances F.C./Special Conditions

- Fully functional personnel and waste decontamination units will be erected on the roof to allow for abatement of the elevator mechanical rooms, the engineers office and storage rooms.

- As of the drafting of this specification it is not known whether the OCME investigation of the roof gravel will be performed before or after the decontamination units are erected on the roof. Attached in Appendix H are the NYCDEP accepted procedures for “Roof Clean-Up & Search for Potential Human Remains”. If the investigation happens after the decontamination units are erected they will be utilized for personal decontamination.
- A hard barrier tunnel from the dirty room of the decontamination units will be erected on the roof along the penthouse to access the engineer’s office, one of the storage rooms and the stairwell leading to the elevator mechanical room.
- The elevator mechanical rooms, engineer’s office and storage rooms in the penthouse at the top of the main stairwell will be abated.
- Once gross abatement in the elevator mechanical rooms is complete, the rooms will be sealed, and HEPA units installed to provide air for cooling the mechanical equipment and filtering and exhausting the cooling air and any air escaping the elevator shaft from its piston action.
- A two stage decon will be installed to the entrance of the elevator mechanical room that can be sealed air tight when not in use to allow access for maintenance of the HEPA units.
- Final cleaning of the engineer’s office, storage rooms, tunnels and the personnel and waste decontamination units will be performed. Upon the Environmental Consultant’s visual inspection and approval, encapsulation and final air clearances per Specification for the Removal of the Building from Containment on the penthouse will be performed. Clearance wipes will not be utilized as the penthouse will be demolished and disposed.
- Upon receipt of acceptable final air clearance results, critical barriers will be left in place in the elevator mechanical room, and the entrance to the abated rooms will be sealed off. The personnel and waste decontamination units will be left for the next phase.

2.7 Phase III A1: Abatement/Demolition of the West Roof Parapet Walls and 90 West St. Façade Clean Up

NYCDEP ACP 7 & 9 Work Area II-A, Variance TM & R

- The fully functional personnel and waste decontamination unit erected for Phase III A will be utilized for this work.
- Tent enclosures per NYCDEP variance Attachment TM will be erected over the gaps between the Building roof parapets and 90 West St. on the north and south of the courtyard.

- The parapet walls will be demolished into the enclosures. Visible debris will be HEPA Vacuumed from the brick & concrete utilizing a HEPA Vacuum labeled and dedicated for the use only in areas of interest to the OCME. The debris from this vacuum will be stored in a designated area until such time as an (OCME) representative inspects the debris.
- After HEPA vacuuming, the brick and concrete will be bagged and disposed of as ACM contaminated.
- A plywood and spray foam seal will be installed between the Building and 90 West St. at the Building roof deck.
- Any horizontal surface uncovered that has collected dust will be HEPA vacuumed with the OCME dedicated HEPA-Vacuum.
- A low-pressure power wash of the wall of 90 West St. will be performed per the Building Facade Clean Up procedure (Appendix G) issued by the NYCDEP after the WTC Event.
- Upon the Environmental Consultant's visual inspection and approval, final air clearances will be performed.
- Upon acceptable results of the air clearances samples the tent enclosures will be torn down, with the poly bagged as ACM.
- The fully functional personnel and waste decontamination unit will be left to perform the parapet abatement in Phase III B and the roof abatement in Phase III C.

2.8 Phase III B: Abatement of Floors 10, 11 & 12

NYCDEP ACP 7 & 9 Work Area IV -B, Variances F.C./Special Conditions

For sections where the exterior damage is such that hard walled containments proposed in Option #1 is not feasible, erect a hard walled containment on the scaffold on most of the north side and the north end of the east side of the Building per Exterior Wall Containments Option #2 (Appendix B) to allow for abatement and demolition of these damaged sections of the parapet and exterior wall and windows under containment. This containment will extend above the roof parapet above the floor 12 and on to the roof.

Utilize the fully functional personnel and waste decontamination unit on the roof previously utilized for the roof parapet gap abatement in Phase III A1 for personnel to erect and access the top of the hard walled containment on the scaffold. A two stage decon will be attached to the roof section of this containment to allow for entering and exiting of personnel only. All waste from the parapet abatement and selective demolition will be taken out through the floor 12 access to the main floor containment.

Access to this containment from the floors will initially be made by removing one of the windows, and subsequently through the first section of wall that is abated and demolished.

Where there is no damage to the brick cladding on either side of a bay where the spandrel wall is damaged or breached, erect an Exterior Wall Containment Option #1 or #1A. (Appendix A)

For the undamaged, not breached, sections of the exterior walls perform containment set-up as follows:

- In bays where the exterior spandrel walls below the windows are found to be intact and not damaged or breached and therefore NOT considered interstitially contaminated with WTC dust, erect an Exterior Wall Containment Option #1B. (Appendix A).

To abate the gap between the exterior of the Building on the west and the exterior of 90 West St. on the east, north & south of the courtyard, demolish the Building wall from and to the inside of the building/floor containment.

- Begin with the bottom of the wall on the lowest floor of the containment, in the case of this Phase III B that will be floor 10.
- Install a seal, utilizing plywood & spray foam, between the Building and 90 West St. at the Building floor 10 deck.
- The West walls will be demolished into the enclosures. Visible debris will be HEPA Vacuumed from the brick & concrete utilizing a HEPA Vacuum labeled and dedicated for the use only in areas of interest to the OCME. The debris from this vacuum will be stored in a designated area until such time as an OCME representative inspects the debris.
- After HEPA vacuuming, the brick and concrete will be bagged and disposed of as ACM contaminated.
- Any horizontal surface uncovered on the 90 West St. wall, including the widow wells that has collected dust will be HEPA vacuumed with the OCME dedicated HEPA-Vacuum.
- Once vacuumed these surfaces will be wet wiped.
- Low pressure, power wash, the wall of 90 West St. where there are no window wells, per the Building Facade Clean Up procedure (Appendix G) issued by the NYCDEP after WTC Event.

To abate the back stairwell demolish an access from the women's room hallway into the back stairwell and erect a hard walled barrier in the stairwell between floor 9 and floor 10.

Perform gross abatement on the remainder of the floor as described in this specification. Once gross abatement is complete, erect a two stage airlock at the main stairwell landing and breach the temporary hard barrier to the floor 10 to allow for final cleaning, final air and surface wipe clearance sampling and encapsulation of this work area.

To abate the passenger elevator shaft erect a hard barrier seal in the shaft at the floor 10 deck and perform a wash down per the Building Facade Clean Up procedure (Appendix G) issued by the NYCDEP after the WTC Event.

Upon approval from the Environmental Consultant after a visual inspection of the entire containment including the passenger elevator shaft and the back stairwell, perform final air and surface wipe clearances.

Upon receipt of acceptable final clearance results, teardown the two stage airlock on floor 10 in the main stairwell.

2.9 Phase III C: Roof Abatement (Main Roof, Bulkhead Roofs , 10, 11, 12 Floor Terraces)
NYCDEP ACP 7 & 9 Work Area III-A, Variances FR, FT & R

The OCME investigation of these roofs will take place before any roofing material abatement occurs.

After the final clearance of Phase III B, install a temporary roof/impermeable barrier on floor 10 concrete deck. This work will be performed on the "cleared" floor 10 by general construction workers without PPE.

Once the temporary roof/impermeable barrier is installed on floor 10, utilize the fully functional personnel and waste decontamination units on the roof previously utilized for the roof parapet gap abatement in Phase III A-1 and perform roof abatement by NYCDEP variance Attachment FR, FT & R per the ACP-9.

Removed roof debris will be bagged as ACM. The double bags will be passed through the waste decontamination unit and washed down. The clean bags will then be transported to the ground via the exterior hoist described in Phase IV and put into a lined container.

Upon an acceptable visual inspection of the roof slab and the personnel and waste decontamination units by the Environmental Consultant, final air clearances in the personnel and waste decontamination unit and final surface wipe clearances of the roof slab will be performed.

After abatement of the each terrace roofing material and an acceptable visual inspection of the slab by the Environmental Consultant a temporary roof will immediately be installed on each slab. Should the surface wipe samples fail the clearance analysis the temporary roof will be removed by the abatement contractor, disposed of as asbestos contaminated material and the slab will be re-cleaned. This

procedure will, if necessary, be repeated as many time as necessary to obtain acceptable surface wipe analysis.

Upon receipt of acceptable final clearance results, tear down the personnel and waste decontamination units.

2.10 Phase III D: Abatement of Floor 9

NYCDEP ACP 7 & 9 Work Area IV-C, Variances F.C./Special Conditions

Perform containment set-up as follows:

- In bays where the exterior spandrel walls below the windows are damaged or breached and therefore are considered to be interstitially contaminated with WTC dust, erect an Exterior Wall Containment Option #1, #1A or # 2 as appropriate. (Appendix A or B).
- In bays where the exterior spandrel walls below the windows are found to be intact and not damaged or breached and therefore NOT considered interstitially contaminated with WTC dust erect an Exterior Wall Containment Option #1B. (Appendix A).
- To abate the gap between the exterior of the Building on the west and the exterior of 90 West St. on the east, north and south of the courtyard, demolish the Building wall from and to the inside of the building/floor containment.
- Begin with the bottom of the wall on the lowest floor of the containment, in the case of this Phase III D that will be floor 9.
- Install a seal, utilizing plywood and spray foam, between the Building and 90 West St. at the Building floor 9 deck.
- The West walls will be demolished into the enclosures. Visible debris will be HEPA Vacuumed from the brick & concrete utilizing a HEPA Vacuum labeled and dedicated for the use only in areas of interest to the OCME. The debris from this vacuum will be stored in a designated area until such time as an OCME representative inspects the debris.
- After HEPA vacuuming, the brick and concrete will be bagged and disposed of as ACM contaminated.
- Any horizontal surface uncovered on the 90 West St. wall, including the widow wells that has collected dust will be HEPA vacuumed with the OCME dedicated HEPA-Vacuum.
- Once vacuumed these surfaces will be wet wiped.

- Low pressure, power wash, the wall of 90 West St. where there are no window wells, per the Building Facade Clean Up procedure (Appendix G) issued by the NYCDEP after WTC Event.

To abate the back stairwell, demolish an access from the women's room hallway into the back stairwell and erect a hard walled barrier in the stairwell between floor 8 and floor 9.

Perform gross abatement on the remainder of the floor as described in this specification. Once gross abatement is complete, erect a two stage airlock at the main stairwell landing and breach the temporary hard barrier to the floor 9 to allow for final cleaning, final air & surface wipe clearance sampling of this work area. Additionally, seal off the back stairwell between floor 8 and floor 9.

To abate the passenger elevator shaft erect a hard barrier seal in the shaft at the 9th floor deck and perform a wash down per the Building Facade Clean Up procedure (Appendix G) issued by the NYCDEP after the WTC Event.

Upon approval from the Environmental Consultant after a visual inspection of the entire containment including the passenger elevator shaft and the back stairwell, perform final air and surface wipe clearances.

Upon receipt of acceptable final clearance results, perform encapsulation of this area and teardown the two stage airlock on the floor 9 in the main stairwell.

2.11 Phase III E, F, G, H, I: Abatement from Basement through Floor 8 NYCDEP ACP 7 & 9 Work Area IV-C, Variances F.C./Special Conditions

Perform abatement on floors 8 through the basement utilizing the procedures described in Phase III D. These phases are scheduled to be performed in an overlapping schedule to complete phases from the top of the building down.

- Phases III E: Abatement of Floors 7 & 8
- Phase III F: Abatement of Floors 5 & 6
- Phase III G: Abatement of Floors 3 & 4
- Phase III H: Abatement of Floor 2
- Phase III I: Abatement of Balance of the 1st Floor & Basement. A new hard barrier wall to the south and paralleling the hard barrier wall erected in Phase I will be erected to allow for demolition of the first wall and abatement of the ACM skim coat above it.

2.12 Phase III J: Freight Elevator

NYCDEP ACP 7 & 9 Work Area IV-D, Variances F.C./Special Conditions

Once the gross abatement has been performed, concurrent with the final cleanings and before the final air and surface clearances of Phase III I, the freight elevator shaft will be washed down per the Building Facade Clean Up procedure (Appendix G) issued by the NYCDEP after the WTC Event.

HEPA Units will be installed in basement access to the shafts and in the elevator mechanical room in the penthouse.

Two stage decons will be erected on floors 3, 5, 7, 9 and 11 to allow access to perform the wash down procedure described above. Additionally, access to the shafts from the basement and floor 1, already under containment, will be utilized.

Perform final cleanings on the elevator mechanical room.

Once the final cleanings are complete for Phase III I and the mechanical room and the wash down of the elevators shaft is complete, the Environmental Consultant will perform final visual inspection of these areas.

Upon approval of the visual inspection, perform final air and surface wipe clearances.

Upon receipt of acceptable final clearance results, perform encapsulation of these areas and teardown the personnel, ACM/hazardous waste, and non-porous scrap decontamination units.

2.13 Phase IV: Selective Demolition

Prior to any non-abatement demolition work, an exterior hoist will be erected on Washington St. The hoist will be tied into the Building without breaching containment on any floor. This will be accomplished by exposing spandrel area of concrete slab and/or column at each tie-in location by removing the attached brick from the outside.

There will be a tie-in on every other floor beginning on floor 2. A Hilti or Powers cutting bolt will be used that is 3/4" x 6" with a 5" embedment. This will provide adequate support for the hoist without disturbing the interior of the Building. Erection will be completed in time to support the Phase III C roof abatement.

Remaining demolition will commence on the roof and move down the Building following the abatement work in accordance with the schedule (Appendix E). The exception is the core of the Building containing the main stairway and freight elevator which will be maintained until the abatement phase is complete. A buffer zone of four floors between abatement and demolition shall be maintained. Personnel access to the floor being demolished shall be by the exterior hoist and/or main (clean) stairway.

The Demo Plan Filing Set (Appendix D) details the scope of the demolition. In general, only the structural concrete skeleton will remain (including existing brick cladding on the exterior of the columns).

All demolition debris shall be loaded into mini containers and taken to ground level via the exterior hoist. All necessary measures for dust control shall be taken, including use of temporary barriers and misted water from hoses attached to the water riser in the main stairway. At the end of the work day no loose materials will be left in the open.

2.14 Phase V: Re-Construction

When Phase IV has reached floor 5, re-construction will begin. The work will involve structural steel erection and structural concrete. A tower crane will be required for steel erection and will be placed on Washington Street in accordance with the Site Logistics Plan (Appendix F). The crane will be tied in on abated floors only. Worker access to the construction areas will be via the exterior hoist and/or main (clean) stairway.

3.0 Contaminated Materials to be Remediated During Abatement Phase

The following general procedures will be used for contaminated materials to be remediated during the abatement phase of the project. All horizontal surfaces shall be cleaned of visible dust or debris by wetting and wiping and/or vacuuming the surface. Pre-abatement preparation of all individual work areas (e.g., floors, elevator shafts) shall proceed as follows:

- Contractor shall construct a personal and waste decon unit for use during the abatement phase.
- Contractor shall install negative pressure exhaust machines in the appropriate locations.
- Contractor shall construct isolation barriers to separate the floor work areas from the rest of the Building. These barriers shall be erected to isolate the elevators on each floor using triple flaps, and the stairwells using solid plastic sheeting with a mechanism for emergency exit (i.e., labeling and knife hanging) at each stairwell on each floor.
- Seal the outside air intake in each mechanical room using 6 mil plastic held firmly in place by mechanical means.
- Remove all asbestos containing pipe insulation within the abatement area.
- Clean and remove all non-porous materials (including furniture) from the work area to the visual satisfaction of the Environmental Consultant and dispose of as provided in the Waste Sampling and Management Plan.

- Remove all porous materials and dispose of as asbestos contaminated waste, unless otherwise provided in the Waste Sampling and Management Plan.
- Remove lead-based paint from all columns, wall surfaces, partitions, painted or stained floors, treads, handrails and the stairwell utilizing mechanical techniques that minimize generation of lead dust and release of lead dust (e.g., wet scrape shroud attachments).
- Remove all ACM plaster/skim coat.
- All dust detected in an interstitial space or wall cavity such as a pipe or mechanical chase, said space or cavity will be low pressure power washed in the same way as the exterior façade. All waste water shall be collected and filtered for contaminants prior to disposal.
- Remove fluorescent light ballasts from fixtures. Collect ballasts for disposal in accordance with the Waste Sampling and Management Plan.
- Remove fluorescent light bulbs and place in protective sleeves and dispose of in accordance with Waste Sampling and Management Plan.
- If the 3' high spandrel exterior walls below the windows are deemed or found to be contaminated with WTC dust and/or the window caulking or glazing is sampled and analyses show either to be asbestos containing, erect an Exterior Wall Containment Option #1 or #2 (Appendix A and Appendix B).
- If the 3' high spandrel exterior walls below the windows are deemed or found not to be contaminated with WTC dust and the window caulking or glazing is sampled and analyses show neither to be asbestos containing, critical barriers will be erected on the inside of the window frames.
- Perform first, second and final cleanings of each abatement area.
- The Environmental Consultant shall then perform a final visual inspection of each abatement area. Provided the work area passes the final visual inspection, clearance sampling, including surface microvac and/or air sampling, will then commence in accordance with the Specification for the Removal of the Building from Containment.

4.0 Full Containment Worksite Procedures During Abatement Phase

Contractor shall, at a minimum, perform all functions listed below where applicable during the Abatement Phase.

- Construct full worker and waste decontamination facilities in accordance with the conditions specified in NYCDEP Title 15, Chapter 1 and in accordance with NYCDEP variance attachment DI, where applicable, as

well as NYSDOL ICR 56. Decontamination units shall be constructed in the following locations.

- A personnel decon shall be constructed on the 1st floor (or other location, as identified by Owner).
- A waste decon shall be constructed on the 1st floor, leading from the elevators to the loading dock.
- Install HEPA filtration units per floor in accordance with the NYCDEP variance. HEPA filtration and auxiliary air ventilation shall conform to this specification, and shall exhaust in a location designated by and/or acceptable to Owner.
- Install critical isolation barriers in accordance with NYCDEP Title 15, Chapter 1 and NYSDOL ICR 56.
- Pre-clean the worksite according to NYCDEP Title 15, Chapter 1, NYSDOL ICR 56 and Section 2.4 of this document.
- Perform asbestos removal in accordance with NYCDEP Title 15, Chapter 1 and NYSDOL ICR 56 including all variance attachment specifications and required special conditions as specified by the NYCDEP.
- Upon completion of the Abatement Phase, clearance criteria shall be met in accordance with the Specification for the Removal of the Building from Containment.

5.0 Full Containment Worker and Waste Decontamination Facilities

Contractor shall confirm that all decontamination facilities are in compliance with NYCDEP Title 15, Chapter 1 and NYSDOL ICR 56. HEPA ventilation equipment shall be placed in a manner to provide an even distribution of airflow through both the worker and the waste decontamination units. The airflow patterns shall be checked by Contractor via smoke testing at the beginning of each shift.

6.0 Pre-Cleaning Requirements During Abatement Phase

A combination of wet methods and use of HEPA vacuum equipment will be used to pre-clean all objects and surfaces within the proposed access tunnels which will connect the freight and/or passenger elevator lobbies to the work areas. Dry methods, such as dry sweeping, shall not be allowed. When the entire area has been thoroughly cleaned, Contractor shall request and pass a pre-sealing visual inspection before advancing to the next step in the abatement process. Items to be cleaned include, but may not be limited to, the closed conduits.

7.0 Partitions During Abatement Phase

Contractor shall ensure that structural partitions are built to separate the full-containment work areas from non-work areas in all openings larger than 32 square feet except where any one dimension is one foot or less.

Partitions shall be constructed of:

- Conventional 2" x 4" (minimum) non-combustible fire-retardant wood or metal stud framing, maximum 16" center-to-center spacing.
- Fire-retardant plywood or other solid material of at least 3/8" thickness shall be applied to the work side of framing.
- Partitions shall be caulked and sealed at all joints and seams.

Prior to the erection of partitions, the asbestos containing material that will be disturbed during this activity will be:

- Treated first with amended water and removed using wet method and/or by tent or glove bag procedures as deemed appropriate by the Environmental Consultant.
- Removal by these procedures is limited to a maximum of a one-foot wide strip running the length of the partition.
- The area will be monitored during this procedure.

8.0 Plasticizing During Abatement Phase

A variance for no plasticization will be filed with the NYCDEP. The only plasticization required will be critical barriers and tunnels.

9.0 Engineering Controls During Abatement Phase

Prior to mobilization, Contractor shall submit to the Environmental Consultant the manufacturer's specification of each model of HEPA filtered air unit to be utilized on the Project.

Contractor shall provide for and be responsible for the following:

- HEPA filtered units shall be continuously monitored for proper operations and maintenance of filters.
- HEPA filtered air units shall utilize a dedicated power source. Multiple units shall be turned on one by one to ensure that integrity of plastic barriers is maintained.
- HEPA filtered units shall run continuously from beginning of isolation until successful air clearance results have been obtained pursuant to Specification for the Removal of the Building from Containment.
- On each floor, Contractor shall maintain a minimum of four (4) units. Contractor shall also maintain a minimum of two (2) spare units on each floor that can be immediately used in the event of the failure of one or more HEPA filtered air units not resulting from a power outage or other outside cause.

- If loss of electric power should occur, abatement work during the Abatement Phase shall stop immediately until power is restored.

Power failures longer than one-half hour will require:

- Decontamination units sealed after evacuation of workers.
- All adjacent areas will be monitored for fiber contamination by the Environmental Consultant.

10.0 Worker Protection During Abatement Phase

All workers shall be certified asbestos handlers and shall bring to the work area and present for inspection each day their handler certificate, copies of documentation indicating successful completion of their initial training courses and any necessary refresher courses and copies of their most recent medical evaluation.

Asbestos handlers entering the enclosure(s) shall:

- Remove all street clothes and don disposable suits (provided by Contractor) at the worker decontamination facility, then proceed directly to the work area. Suits shall be Tyvek or Tyvek equivalent outer and may be spun poly inner.
- Wear appropriate NIOSH-approved HEPA filter personal respiratory equipment, as deemed necessary by the work being performed. Full-face, positive-pressure air purifying respirators (PAPR) with HEPA filters shall be required in full-containment enclosures. Negative-pressure respirators shall be allowed for preparation activities only.
- Prior to exiting the enclosure(s), asbestos handlers shall remove their disposable suit(s) and proceed directly to the decontamination unit shower room, where full decontamination procedures shall be performed (i.e., showering).
- Personal air monitoring of all workers in accordance with OSHA regulations is the sole responsibility of Contractor. Upon request by the Environmental Consultant, Contractor shall provide written results of this monitoring within 24 hours.

11.0 Disposal Requirements During Abatement Phase

All asbestos waste including the containment plastic, all plastic sheeting utilized in critical barrier construction, disposable suits and any other debris deemed contaminated by the Environmental Consultant, shall be wetted with amended water then placed in clean 6 mil plastic asbestos containing waste bags. These bags shall be wet wiped and/or HEPA vacuumed. Each bag shall then be placed in an additional properly labeled, clean 6 mil plastic ACW bag and sealed airtight. All bags shall be affixed with identification labels indicating site of origin, date and Owner's name.

Storage, transport and disposal of the waste bags shall be in accordance with NYCDEP, NYSDOL, and NYSDOT rules and regulations and in compliance with Specification for Waste Stream Classification.

12.0 Ambient Air Monitoring During Abatement Phase

Air monitoring shall be conducted by the Environmental Consultant, except OSHA-mandated personal air monitoring of abatement workers which shall be the responsibility of the Contractor. Ambient air samples shall be collected before, during and after the work until the Abatement Phase is completed. Samples collected during the work shall be analyzed using NIOSH 7402 protocol with <0.01 fibers/cm³ as the acceptable threshold level, unless background fiber concentrations are greater. If any ambient air samples equal or exceed the greater of 0.01 f/cc or the background levels, all work shall stop and the areas inside and adjacent to the containment shall be wet wiped and HEPA vacuumed. All air monitoring will be conducted in accordance with applicable sections of NYCDEP Title 15, Chapter 1 and NYSDOL ICR 56.

13.0 Post Abatement Phase Air Sampling

- The work area is considered ready for re-entry when it is visually clean and meets the criteria set forth in the Specification for the Removal of the Building from Containment.

14.0 Appendices

2.1 Appendix A: Exterior Wall Containment Barrier Option 1



Exterior Wall Containment Barrier Option #1

Option #1

This option for construction of an exterior hard walled containment barrier will be utilized when there is an exterior breach in the wall and the brick cladding on the columns on either side of the bay are intact. A double six mil poly covered plywood barrier will be anchored to the brick cladding on each side of the bay from slab to slab. Caulking and foam will be utilized as necessary to seal this barrier. A foam sealed plywood insert will be installed at the top and the bottom of this barrier to seal the set back from the column brick cladding to the slab brick cladding. The windows, window caulking and the two wall unit spandrel walls will be abated and demolished into the building/containment.

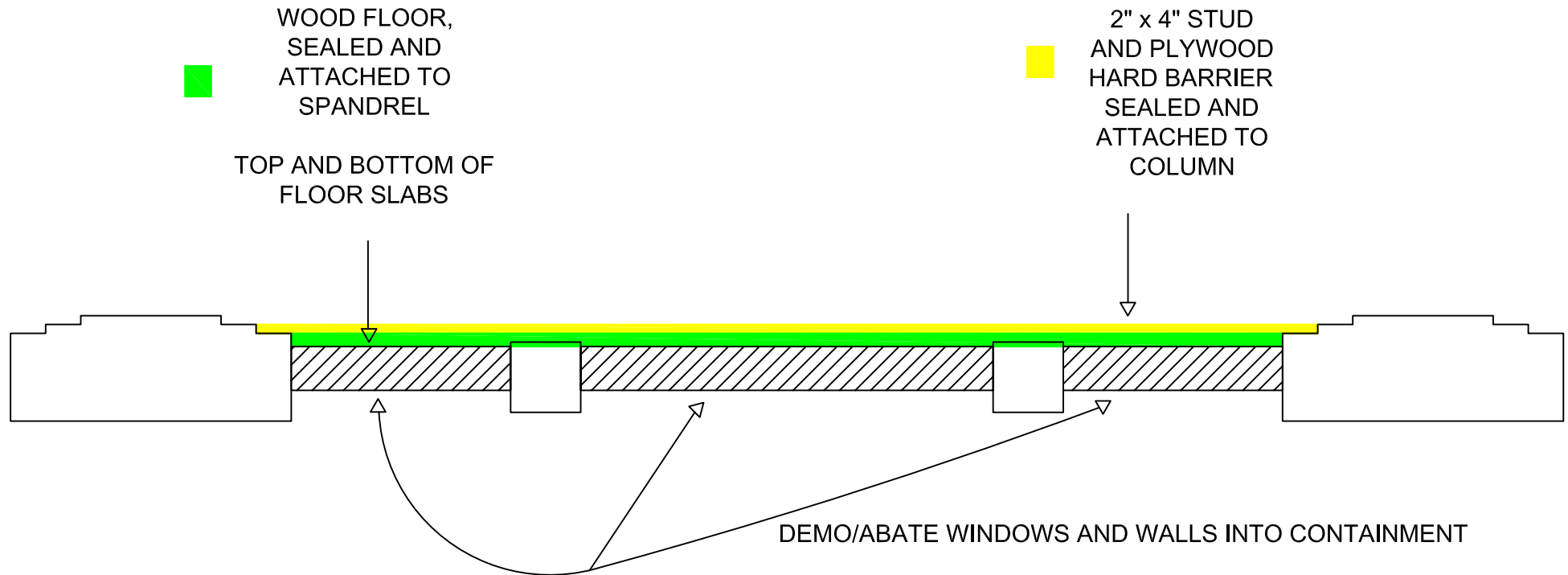
Option #1A

Where the breach in the two wall unit spandrel wall is from the inside only, a hard walled containment as in Option #1 will be erected. Additionally in this option, a plywood support will also be anchored up against the exterior of the brick cladding of the spandrel wall. This support will allow for the interior clay wall to be demolished generally, the entire interior wall or localized, locally around the small breach and abated leaving the exterior brick cladding and the cast concrete cap of the two wall unit spandrel wall standing. The interstitial space, the inside surface if the brick cladding, will be cleaned as any other no-porous concrete surface, encapsulated and left for demolition during the selective demolition phase. Additionally, the windows and window caulking will be abated and demolished into the building/containment.

Option #1B

Where there are no breaches in the two wall unit spandrel wall, the wall surfaces will be cleaned, encapsulated and left for demolition during the selective demolition phase. The exterior hard walled containment will span the window opening from column to column and top slab to the cast concrete cap on top of the two wall unit of the spandrel wall to allow for the windows and window caulking will to be abated and demolished into the building/containment.

EXTERIOR WALL CONTAINMENT BARRIER OPTIONS #1, #1A & #1B



#1A - CONSTRUCTED AS SEEN ABOVE WITH ADDITIONAL SUPPORTS
ON THE EXTERIOR SURFACE OF THE SPANDREL WALL

#1B - THE BOTTOM OF THE HARD BARRIER CONTAINMENT WILL BE
SEALED AT CAST CONCRETE CAP OF THE SPANDREL WALL

2.2 Appendix B: Exterior Scaffold Containment Barrier Option 2

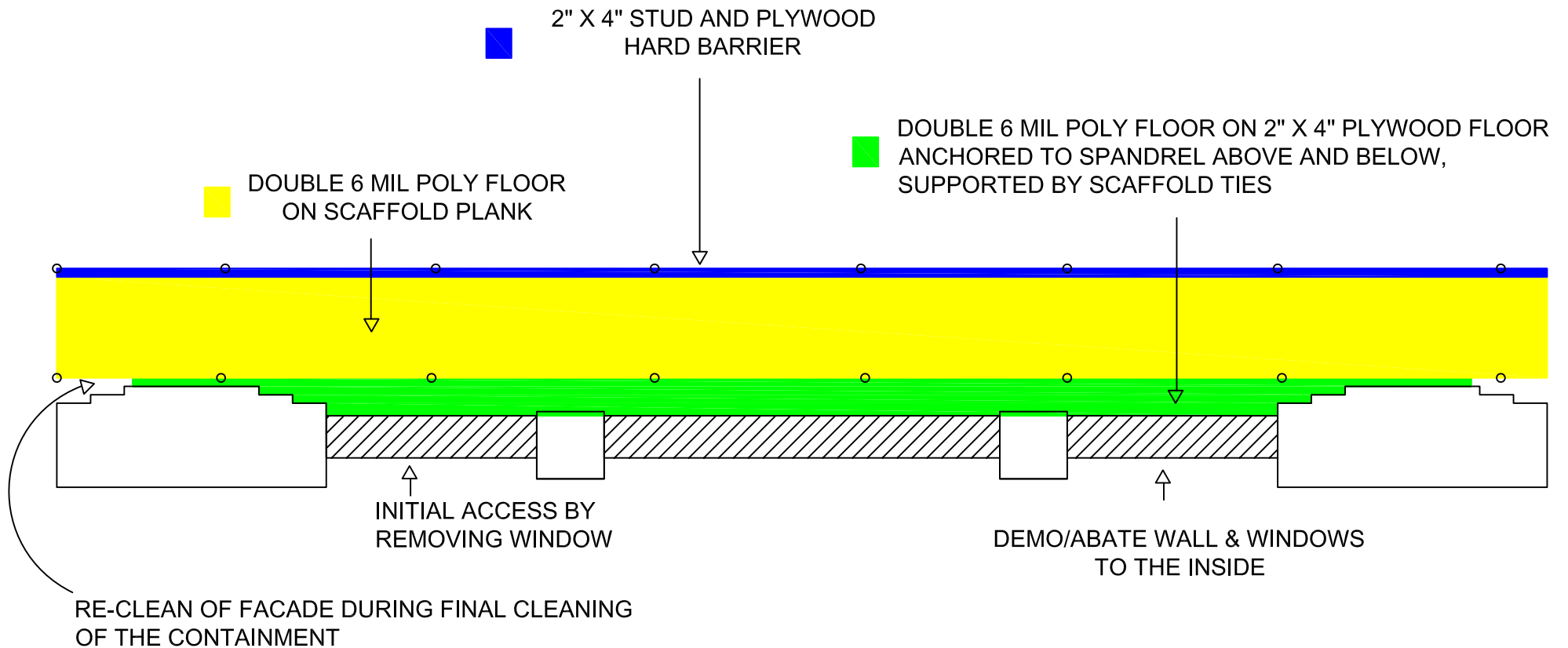


Exterior Wall Containment Barrier Option #2

Option #2

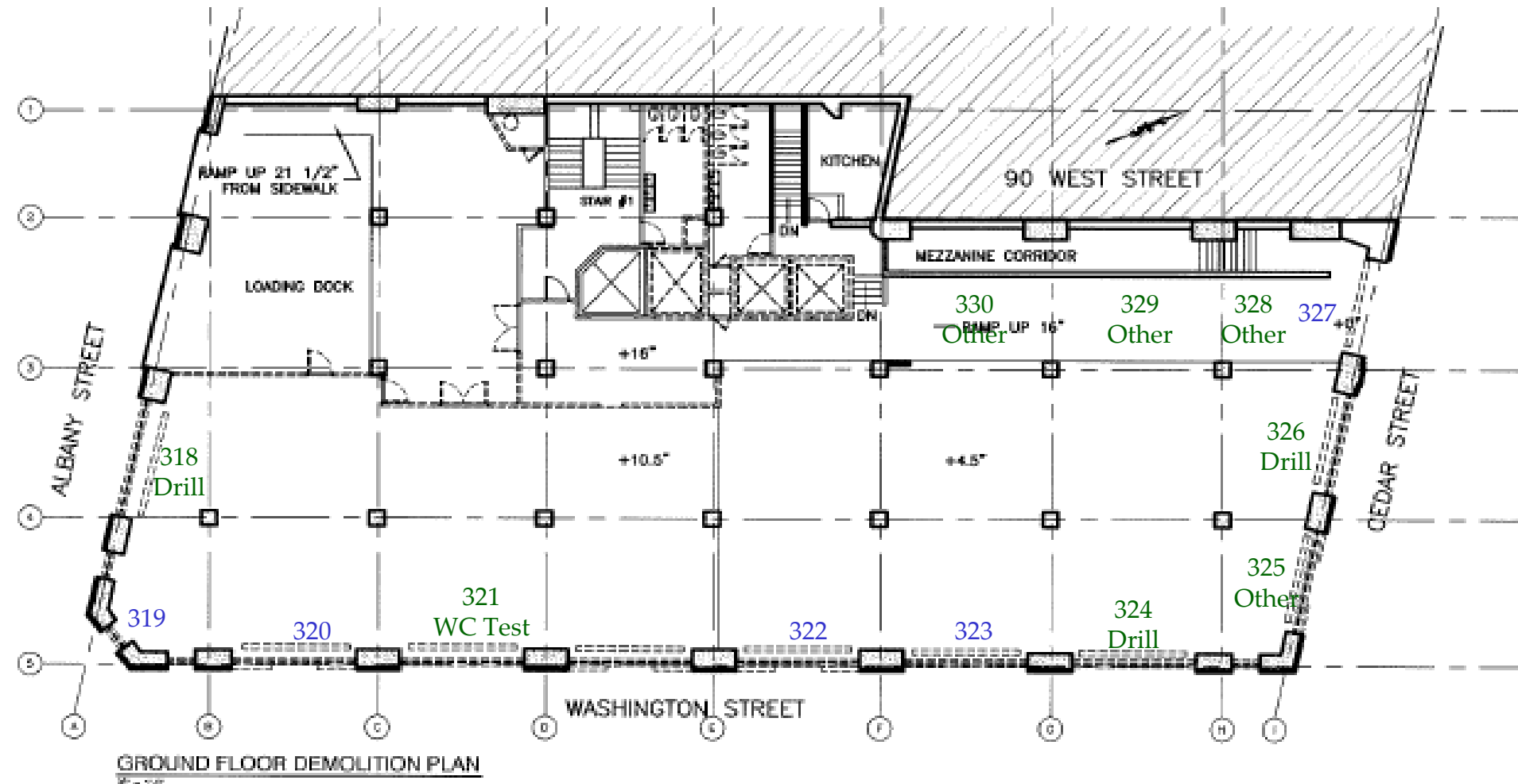
This option will be utilized when the brick cladding on the columns is damaged or not intact thus prohibiting proper anchoring and sealing of a single hard plywood barrier. In this case, a hard barrier containment will be set up on the exterior scaffold to include a floor and ceiling sealed to the exterior of the building. This will allow for abatement and demolition of the windows, spandrel wall and any loose or damaged brick cladding into the building/containment.

EXTERIOR SCAFFOLD CONTAINMENT BARRIER FOR PORTIONS OF 10TH, 11TH & 12TH FLOORS AND OPTION #2

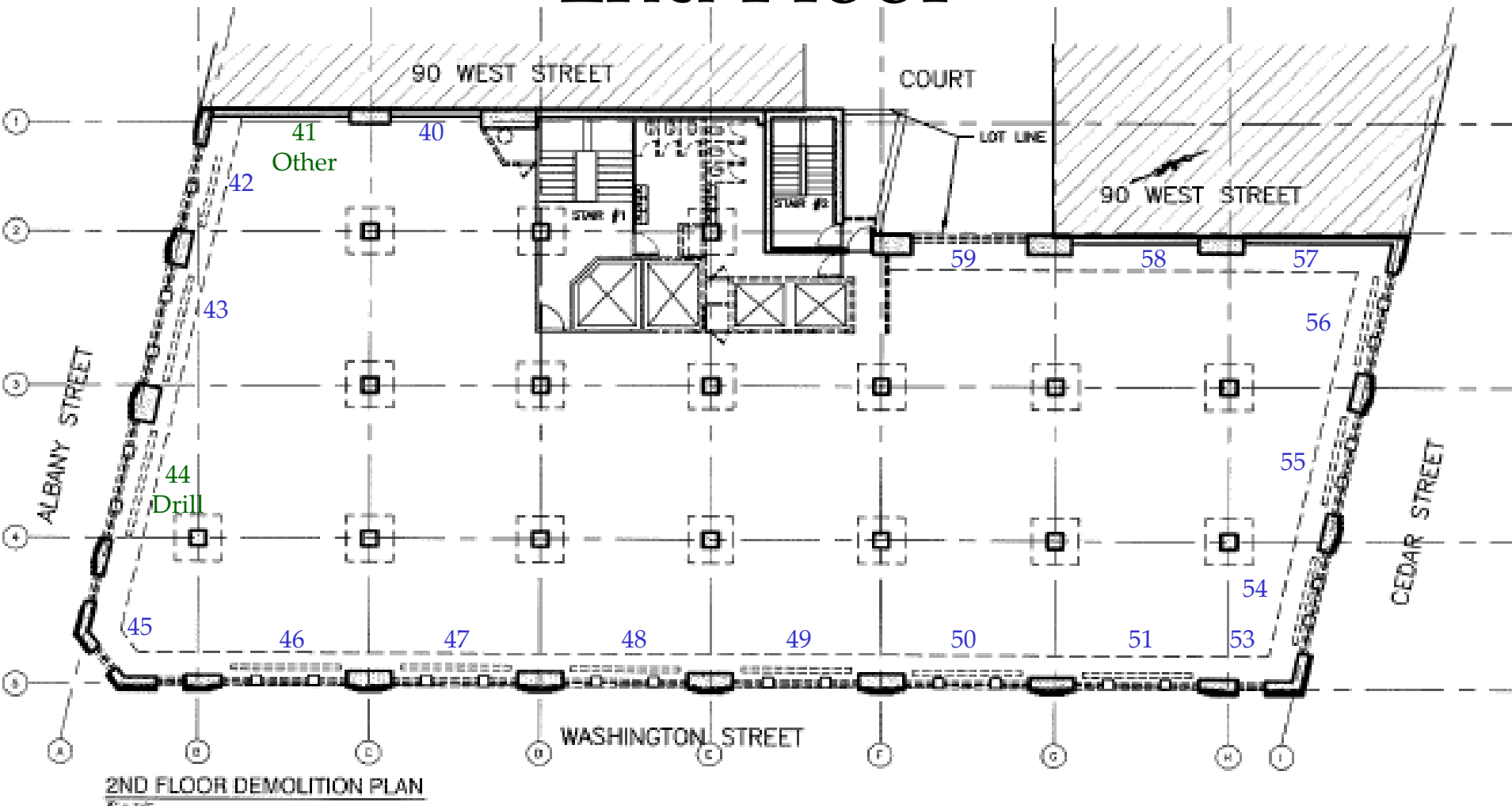


2.3 Appendix C: Spandrel Walls

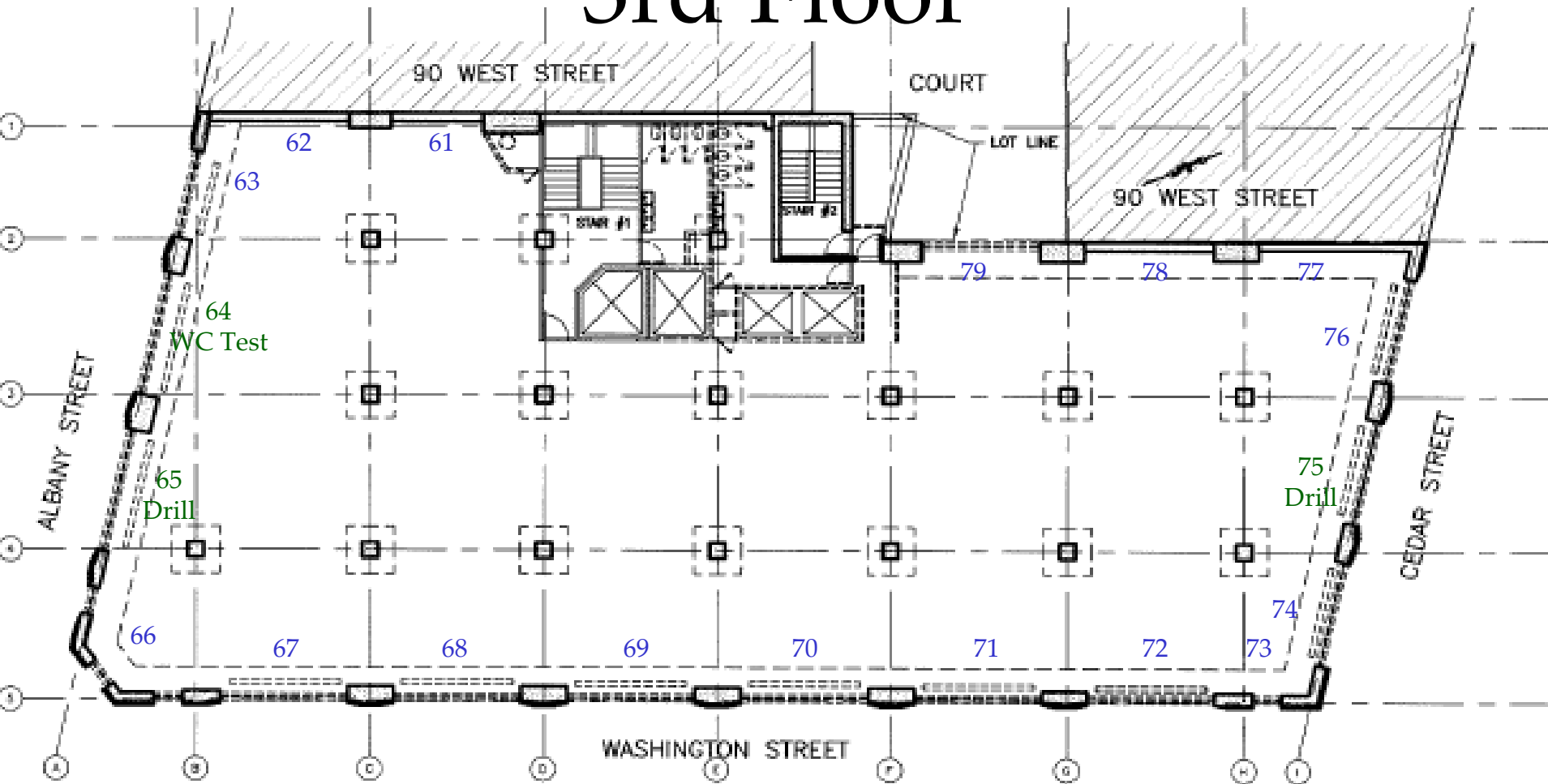
Ground Floor



2nd Floor



3rd Floor

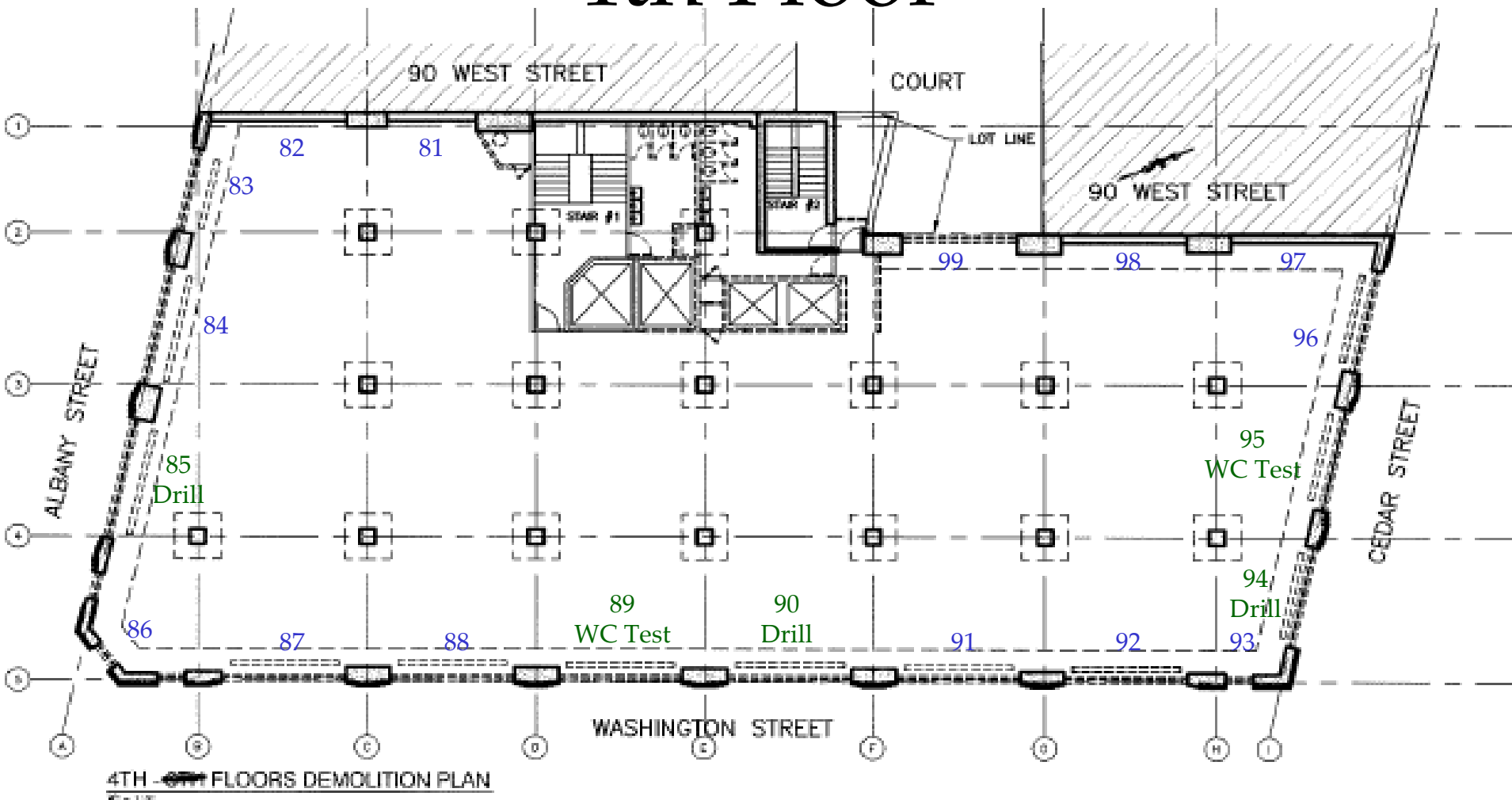


BASIS FOR REVOLUTIONARY PLAN

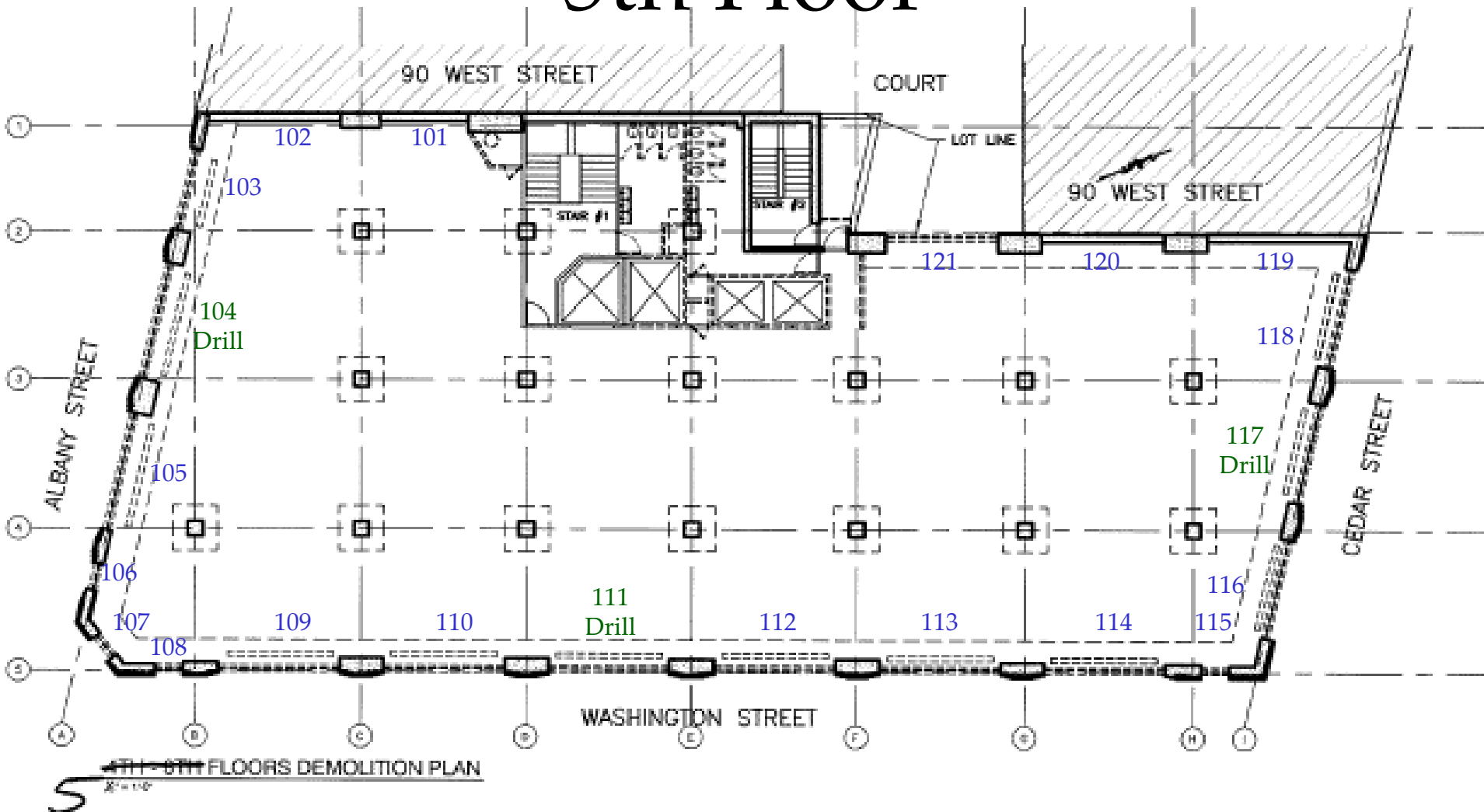
2/1/10

3

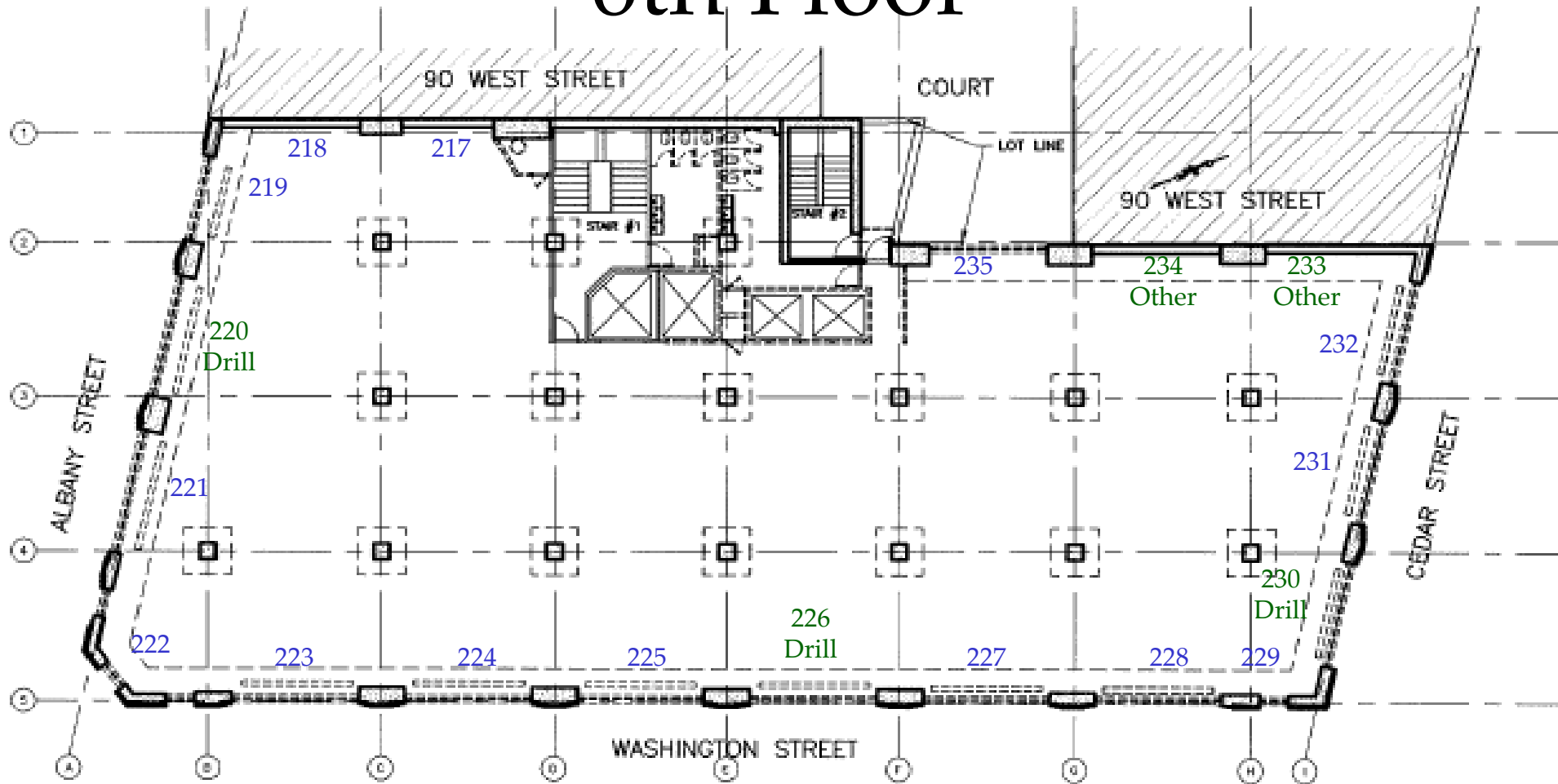
4th Floor



5th Floor

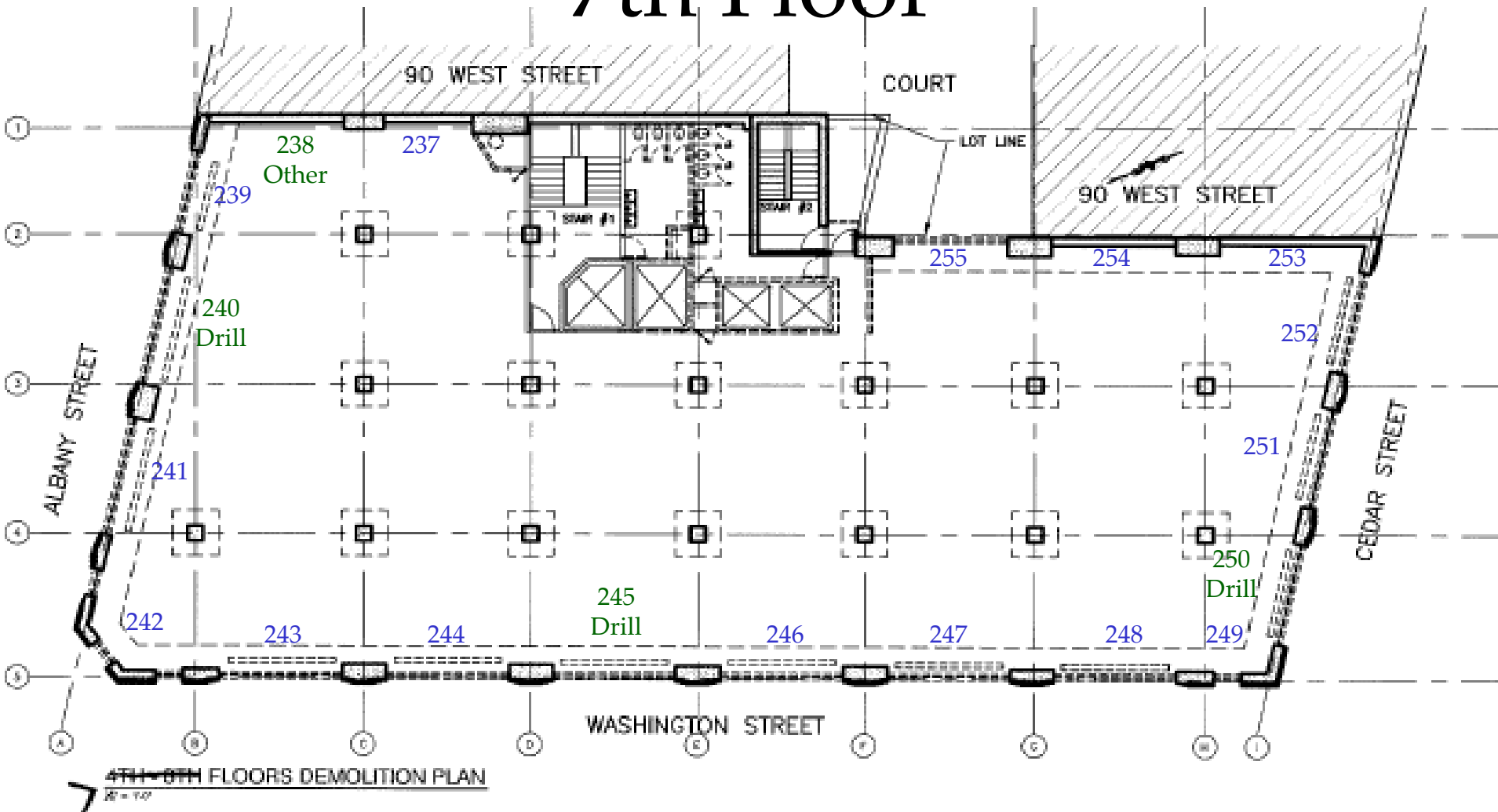


6th Floor

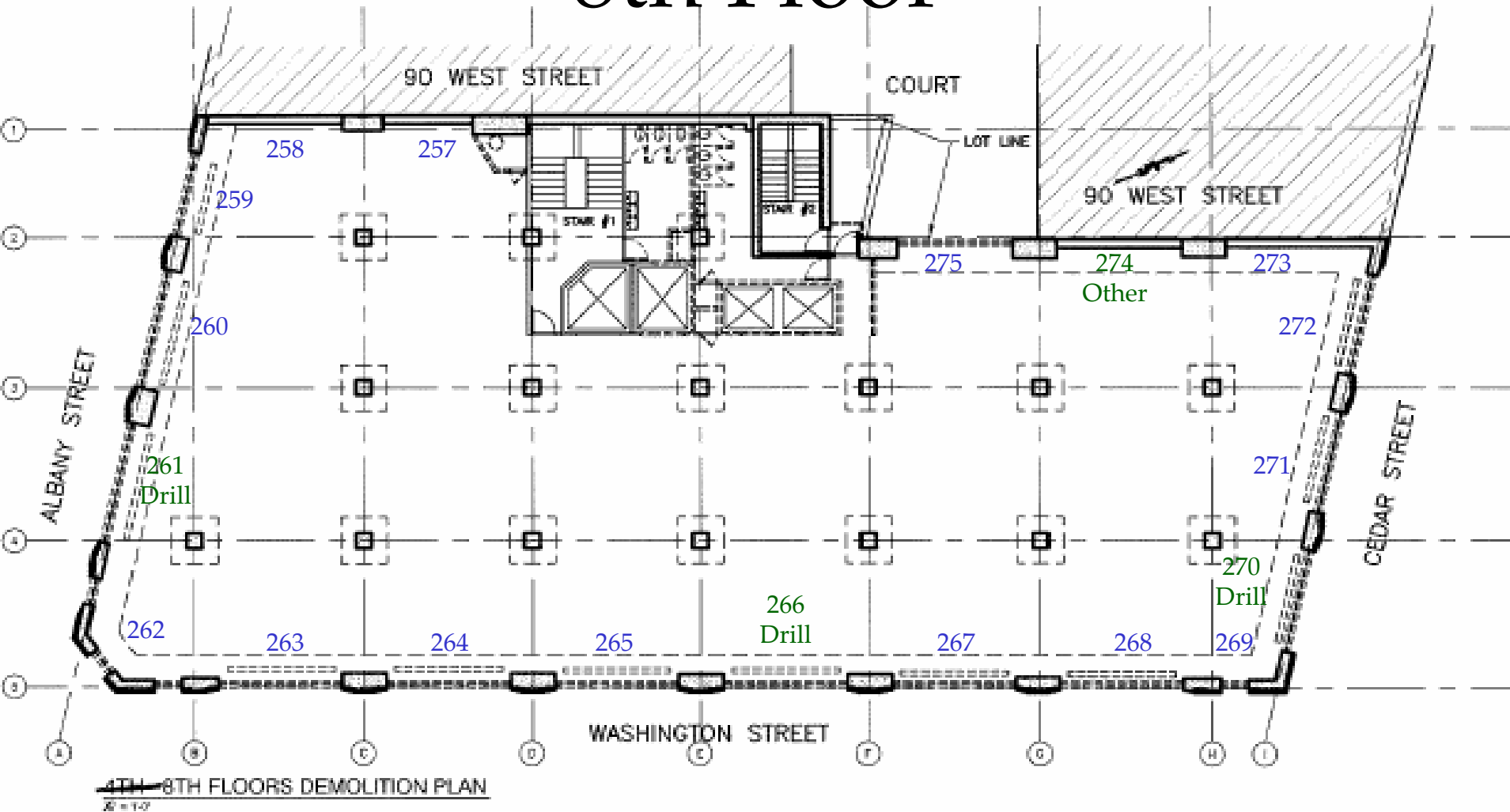


6
4TH-6TH FLOORS DEMOLITION PLAN
1/8" = 1'-0"

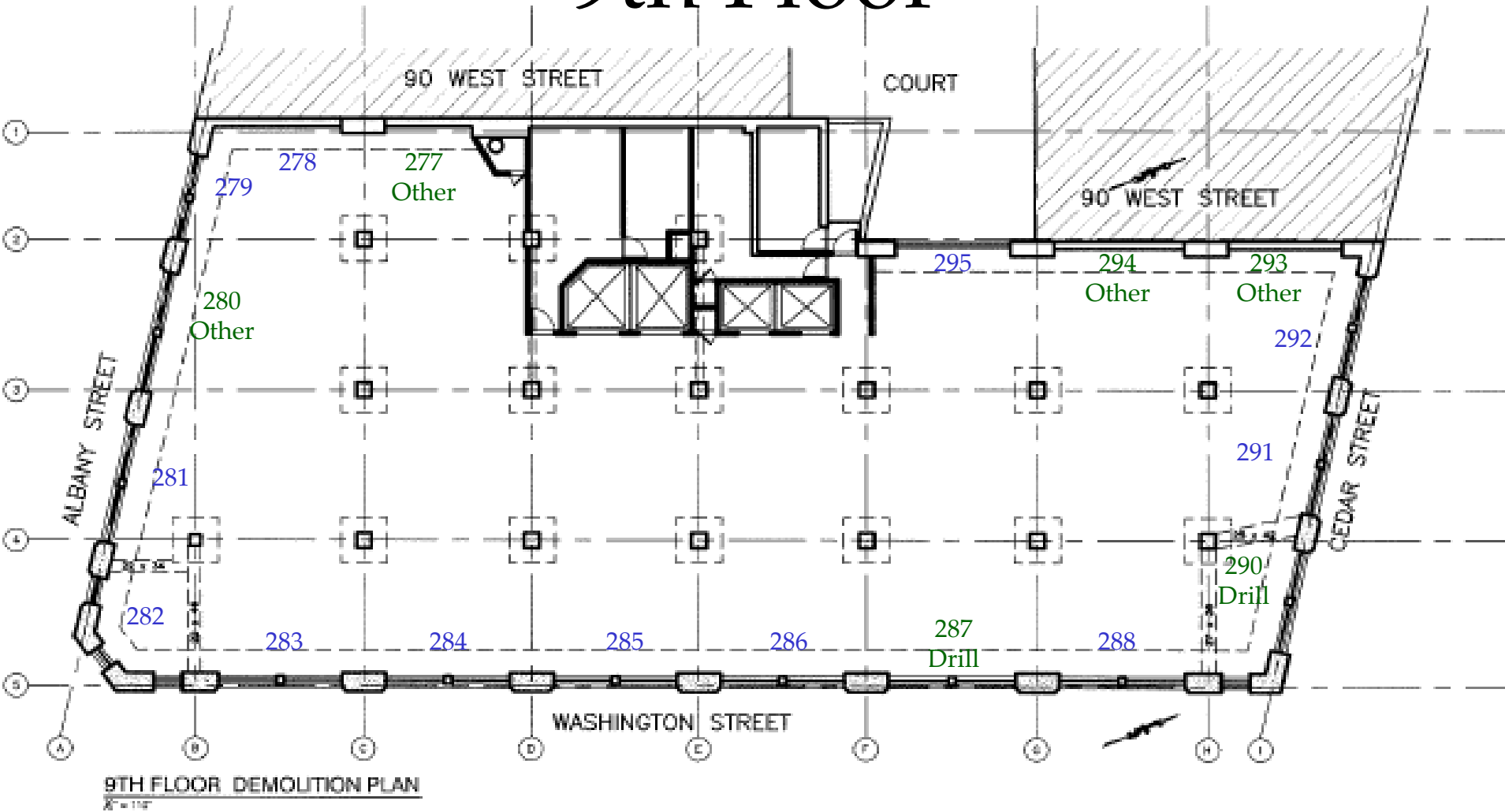
7th Floor



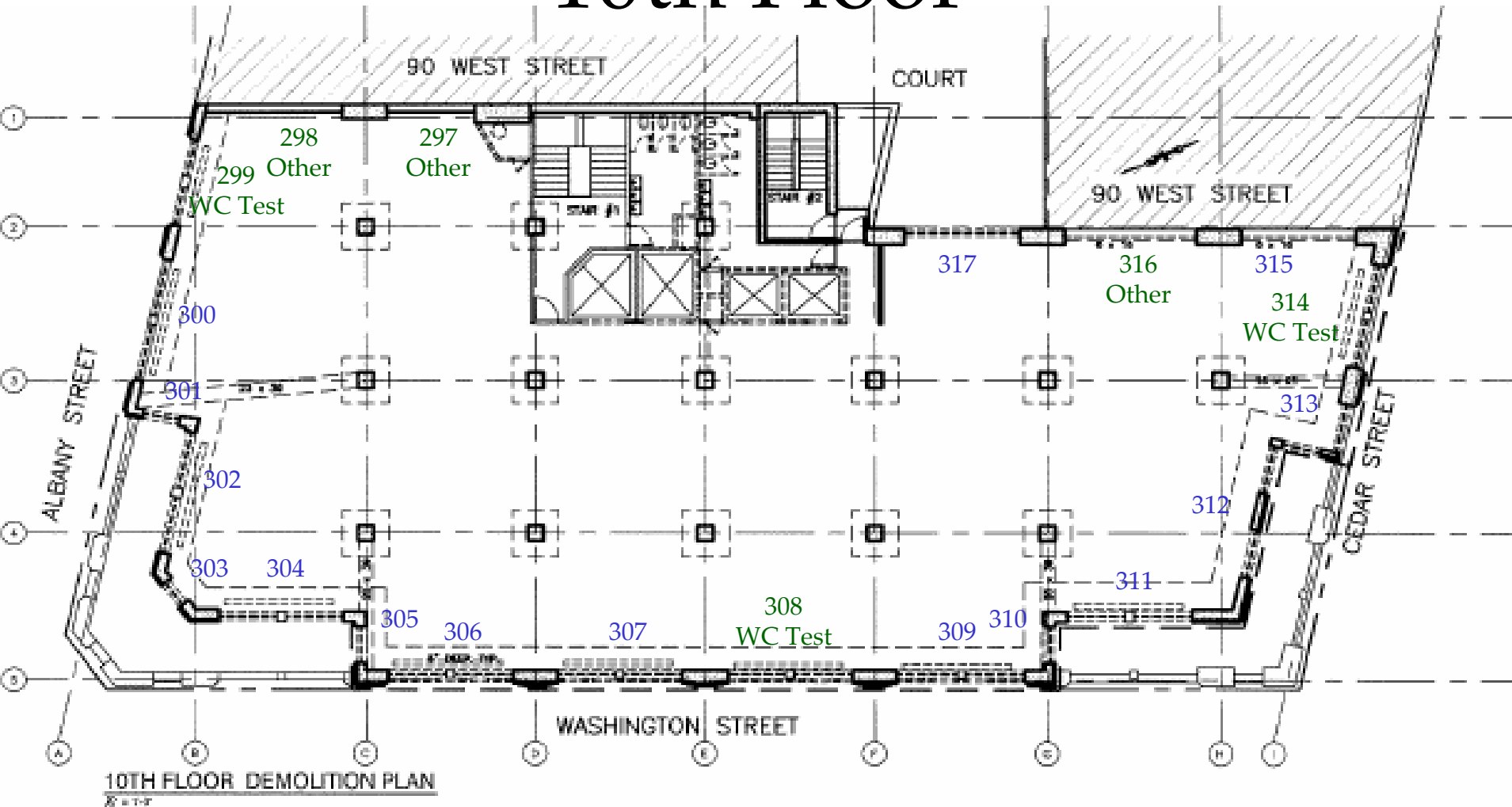
8th Floor



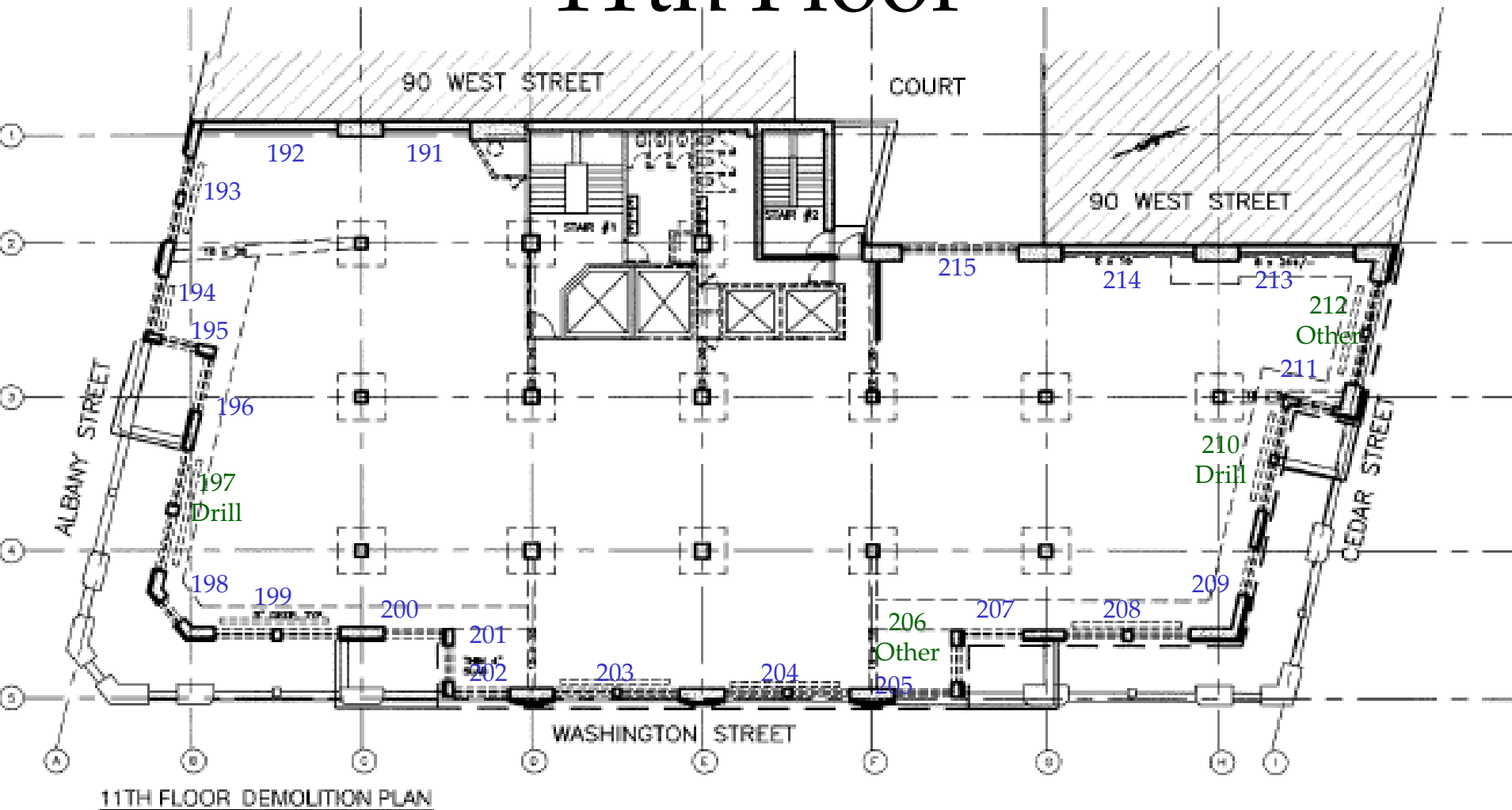
9th Floor



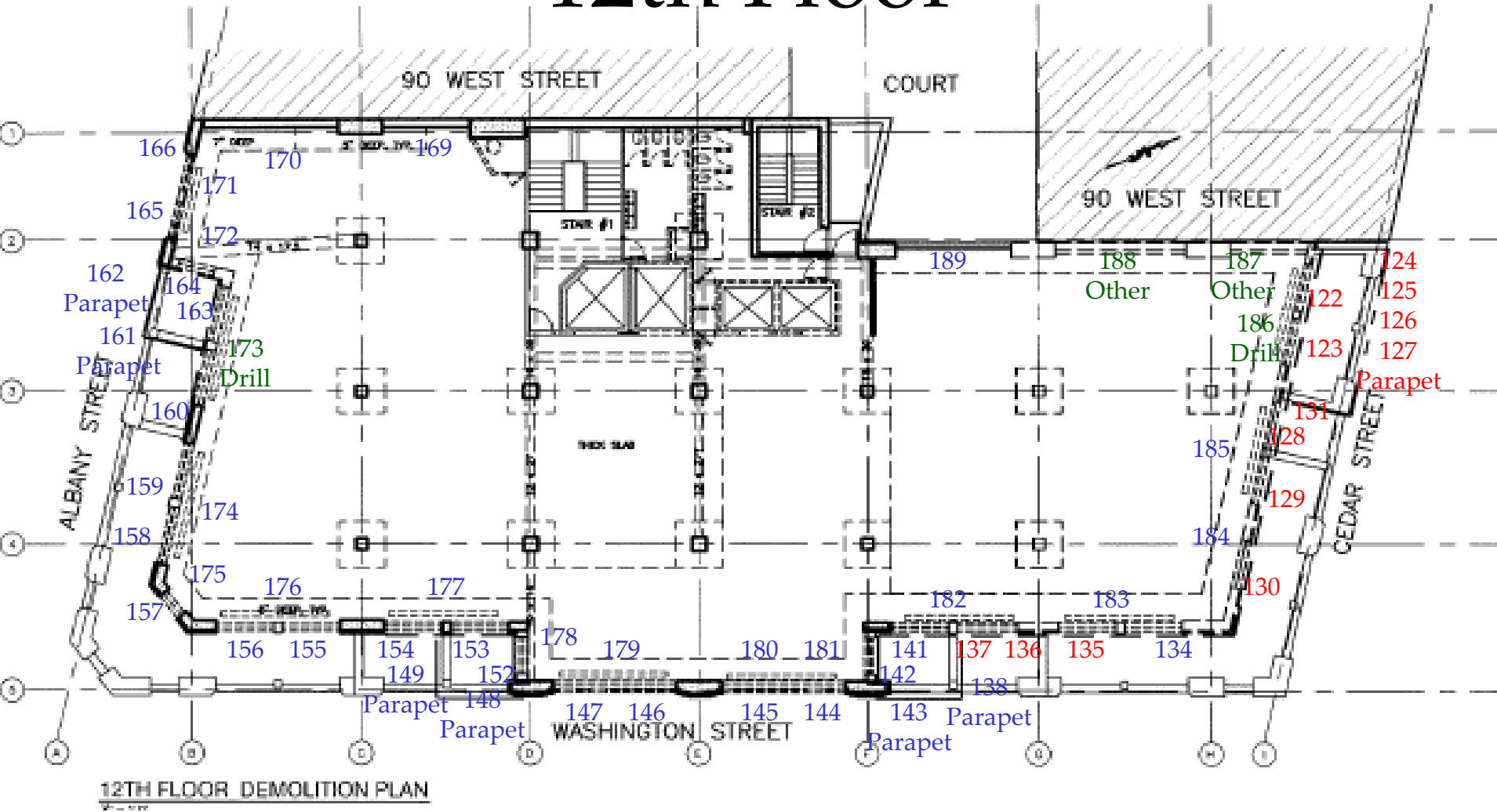
10th Floor



11th Floor



12th Floor



2.4 Appendix D: Selective Demolition Drawings

130 CEDAR STREET

GENERAL NOTES

1. All work shall comply with applicable local and municipal building codes, as well as any and all regulatory agencies, including, but not limited to, OSHA. General Notes shall apply to all drawings.
3. The Contractor shall verify all job conditions, dimensions and details prior to construction, and as anticipated or inferred prior to pricing or bidding. Koenen Associates shall be notified of any discrepancies or omissions which would interfere with the satisfactory completion of the work, prior to the start of any and all work.
4. The Contractor shall have had experience on at least three projects involving qualities and complexities at least equal to those required under all divisions detailed in these drawings. All workmen performing under this work shall be skilled workmen in their respective trades.
5. All work, whether shown or implied, unless specifically questioned, shall be considered fully understood in all respects by the General Contractor, and he will be responsible for any misinterpretations or consequences thereof for all work on all drawings.
6. The Contractor shall review and familiarize himself with the General Notes & Specifications dwg. and determine which notes apply directly to his responsibility. Each subtrade will be responsible for reviewing the entire set of drawings and noting their work as applicable. All labor, materials, equipment, etc. required for the work as indicated or inferred on the drawings will be deemed and included in all Contractors' costs.
7. Construction Manager shall be responsible to pick up the building permit at the Building Department offices and pay all outstanding fees.
8. Construction Manager shall provide all the drawings, completed paperwork, and certificates of inspection and shall perform all the controlled inspections as required for Building Department approval.
9. Upon completion of the job, the Construction Manager shall submit certificates of inspection and a certificate of substantial completion (A.I.A. Document #G-704).
10. The Construction Manager shall submit in writing all proposals for additional work to the Architect's office for review and approval. No work is to proceed until a signed authorization to proceed is returned to the Construction Manager.
11. The Owner reserves the right to let other contracts in connection with the work of the project. The Construction Manager shall be responsible for coordination of work and establishing schedules for all trades; he shall afford other Contractors reasonable opportunity for the introduction and storage of their materials and equipment and the execution of their work.
12. Contractor shall schedule all work to conform to the General Construction Schedule and shall cooperate with other Contractors in the required Sequential Installation Schedule as approved by the Architect.
13. Drawings are not to be scaled; dimensions govern.
14. All work is to conform to KA drawings and specifications and shall be new and best quality of the kind specified, unless specifically noted for existing to be reused.
15. Each Contractor is to maintain a complete and up-to-date set of drawings on the job at all times, including Contract Documents and Shop Drawings.
16. No material substitutions shall be made. KA will consider material change requests on an individual basis. Contractor shall submit samples and cuts for written approval by KA prior to the start of any work.
17. All manufactured articles, materials, and equipment shall be supplied, installed, connected, erected, used, cleaned, and conditioned as directed by the architect by the manufacturers, unless otherwise specified on the drawings.
18. All Contractors' shop drawings shall be submitted to KA for approval through the Construction Manager prior to work being performed, unless otherwise noted.

20. The Contractor shall be responsible for arranging with Construction Manager the use of elevator or other hoisting facilities for handling the delivery of materials. The Construction Manager shall be responsible for notifying all subtrades of conditions regarding elevator cab size, door openings, etc. any and all fees involved for the use of the hoisting facilities will be the responsibility of the Construction Manager.
21. Egress routes and fire stairs shall be kept clear at all times.
22. The Construction Manager shall maintain and operate an on site field office telephone and fax machine at all times during the course of construction work.
23. Workmen will be assigned one toilet area which the General Contractor will be responsible for cleaning, maintaining, and upon completion of the work, restoring to its original condition.
24. Construction personnel must carry proper identification at all times.
25. All ladders and scaffolding shall be in good operating condition. All damaged ladders, bakers, and rolling scaffolding shall be immediately removed from the job site.
26. All windows shall be kept closed in the work areas.
27. Fire extinguishers must be kept on the job site during construction.
28. The Construction Manager shall be responsible for maintaining the cleanliness of the work area and the areas involved in the delivery of his materials.
29. Construction Manager is responsible to clean up and remove from the premises all waste materials, rubbish, wrappings and salvages as generated by the construction, demolition and/or the delivery and installation of any products, materials, or equipment which is part of the Contract.
30. The Construction Manager will be responsible for all costs incurred for damages caused by his Subcontractors.
31. All existing structural shoring to remain; protect during demolition process
32. Each Contractor shall have a competent superintendent on the premises at all times when work is in progress.
33. All new shoring required for demolition to be designed by licensed engineer. Signed and sealed shop drawings to be submitted for approval.

DEMOLITION SCHEDULE

1. INTERIOR NON-BEARING PARTITIONS AS INDICATED ON THE CONTRACT DRAWINGS INCLUDING, BUT NOT LIMITED TO: ELEVATOR SHAFT ENCLOSURES, STAIRWAY ENCLOSURES, RESTROOM WALLS.
2. DELETED.
3. ELEVATOR EQUIPMENT, RAILS, CARS, AND MOTORS AND ENCLOSURES.
4. ROOFTOP WATER STORAGE TANKS AND RELATED DUNNAGE.
5. PLUMBING FIXTURES AND RELATED PIPING.
6. ELECTRIC SWITCHGEARS AND PANELS IN BASEMENT
7. STEAM PIPES AND PERIMETER RADIATORS.
8. EXTERIOR BRICK PARAPETS AND FACE BRICKS FROM CONCRETE PARAPETS.
9. ALUMINUM WINDOWS AND FRAMES ON THE NORTH AND SOUTH FACADES. (SEE JLC ABATEMENT PACKAGE FOR STEEL CASEMENT WINDOWS AND STEEL FRAMES BENEATH EXISTING ALUMINUM WINDOWS). COORDINATE REMOVAL OF STEEL WINDOW ASSEMBLIES W/ ABATEMENT CONTRACTOR & CM.
10. EXTERIOR MASONRY SPANDREL PANELS AND NON-BEARING BRICK MULLIONS.
11. ROOFTOP BULKHEAD ENCLOSURES AND CONCRETE STRUCTURE.
12. EXTERIOR CONCRETE FACADE SPANDREL PANELS ON FLOORS 1, 2 & 3.
13. NORTH-END OF MAIN ROOF SLAB AND CONCRETE PARAPET BACKUP AS INDICATED ON CONTRACT DRAWINGS.
14. CONCRETE COLUMNS AND MASONRY WALLS DIRECTLY BENEATH CONCRETE ROOF SLAB TO BE REMOVED, DOWN TO THE 12TH FLOOR SLAB.
15. DELETED.

EXISTING TO REMAIN

1. CONCRETE SLABS, COLUMNS, BEAMS UNLESS OTHERWISE NOTED
2. EXTERIOR MASONRY PILASTERS
3. ALL STRUCTURAL SHORING UNTIL DAMAGED AREA HAS BEEN REMOVED OR REPAIRED.

RELATED WORK

1. SEE JLC ABATEMENT CONTRACT DRAWINGS AND SPECIFICATION FOR COORDINATION AND EXTENT OF ABATEMENT WORK. COORDINATE DEMOLITION W/ ABATEMENT CONTRACTOR & CM.

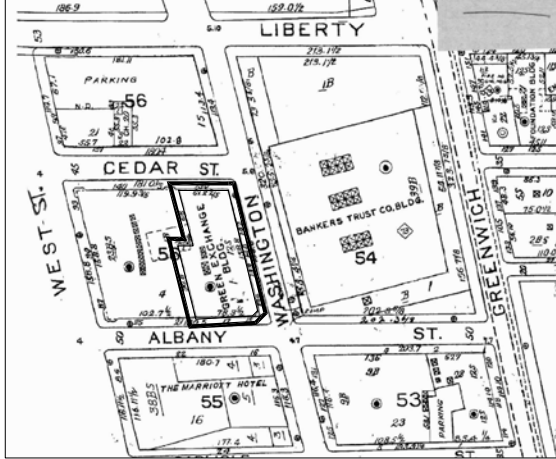
NEW WORK:

1. REMOVAL, REPAIR OR REPLACEMENT OF SHELF ANGLES AT EXISTING BRICK PILASTERS TO REMAIN; ADD FLASHING AND WEEPS AT SHELF ANGLE LOCATIONS.
2. INSTALLATION OF LATERAL REINFORCING PINS, CLEANING AND REPAIR OF ALL EXISTING BRICK TO REMAIN.
3. INSTALLATION OF OSHA-APPROVED GUARD RAILS AT ALL OPEN SHAFTS, WINDOW OPENINGS AND SLAB EDGES.
4. INSTALLATION OF SEMI-PERMANENT WATERPROOFING ENCLOSURES AT ROOF OPENINGS AND OPEN MASONRY JOINTS. (AT PARTY WALLS)
5. INSTALLATION OF CMU ENCLOSURES FOR BASEMENT UTILITIES & REPAIR OF 10TH FLOOR PARTY WALL.

LOGISTICAL NOTES:

1. MAINTAIN FIRESTAIRS & EXIT PASSAGEWAYS AS REQUIRED TO MAINTAIN A MEANS OF EGRESS. REMOVE UPON COMPLETION OF NEW EXIT STAIRS.
2. MAINTAIN FREIGHT ELEVATOR AS REQUIRED TO COMPLETE WORK AND COORDINATE FINAL DEMOLITION OF ELEVATOR W/ CM.
3. CM TO COORDINATE REMOVAL OF PARAPETS, FLASHING, AND ROOFING W/ INSTALLATION OF TEMPORARY ROOF ON 12TH FLOOR SLAB.
4. MAINTAIN PROTECTION OF LOWER LEVEL UTILITY ROOMS UNTIL NEW UTILITIES ARE INSTALLED.
5. MAINTAIN A SPRINKLER/STANDPIPE SYSTEM TO PROVIDE FIRE PROTECTION DURING COURSE OF WORK. CM TO COORDINATE REMOVAL OF SYSTEM UPON COMPLETION OF NEW SYSTEMS OR THROUGH OTHER MEANS APPROVED BY THE APPROPRIATE LOCAL AUTHORITIES.

SITE PLAN



BUILDING CODE DATA

SITE:
BLOCK: 56 LOTS 1 & 3
130 CEDAR STREET
NEW YORK, NEW YORK

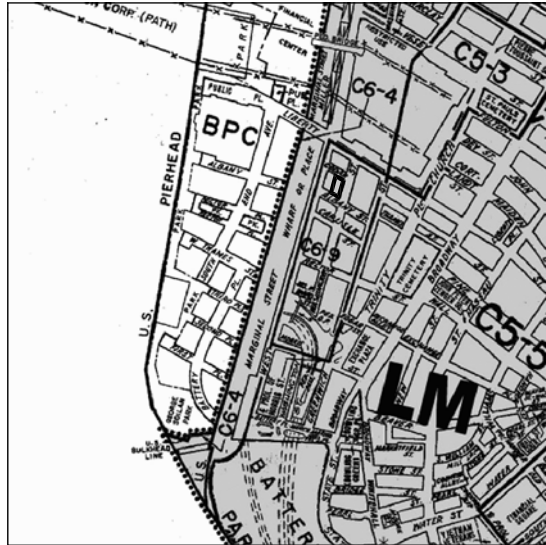
BUILDING DEPARTMENT NOTES

1. Building is to be examined under Old Code.
2. Building is Class 1 Fireproof Construction.
3. Existing CO; complies; no change to use, occupancy, zoning, fire protection or egress.
4. Items subject to controlled inspection: None.
5. All work shall comply with NYCDOB requirements, rules, and regulations.

ZONING DATA

ZONING DISTRICT: C6-9, LOWER MANHATTAN SPECIAL DISTRICT

ZONING MAP



DRAWING LIST

- D1-0 TITLE PAGE
D1-1 INTERIOR DEMOLITION FLOOR PLANS
D1-2 EXTERIOR FACADE DEMOLITION AND RESTORATION DRAWINGS

SIGN & SEAL

- 09-22-06 COORDINATED W/ SCHEMATIC DESIGN
11-09-04 PERMIT RESUBMISSION (CAD DRAWING)
10-04-04 REVISED FOR CONSTRUCTION (HAND DRAWING)
07-05-04 FOR BID & PERMIT

ISSUE DATE REVISION

130 CEDAR STREET
NEW YORK, NEW YORK

SELECTIVE DEMOLITION
& FACADE RESTORATION

OWNER:
CEDAR & WASHINGTON STREET
ASSOCIATES, LLC

ARCHITECT:
KOENEN ASSOCIATES
ARCHITECTS AND PLANNING CONSULTANTS
6 West 18th Street New York, New York 10011
Tel: 212/206-8333 Fax: 212/633-6476

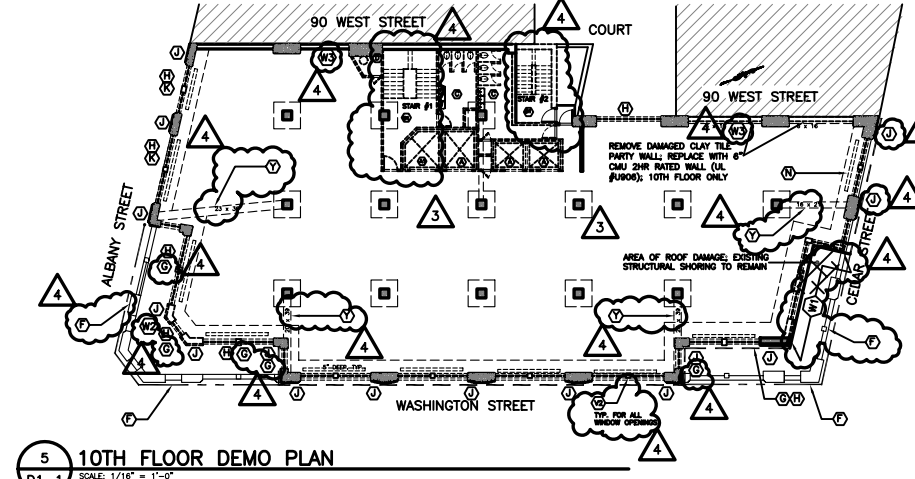
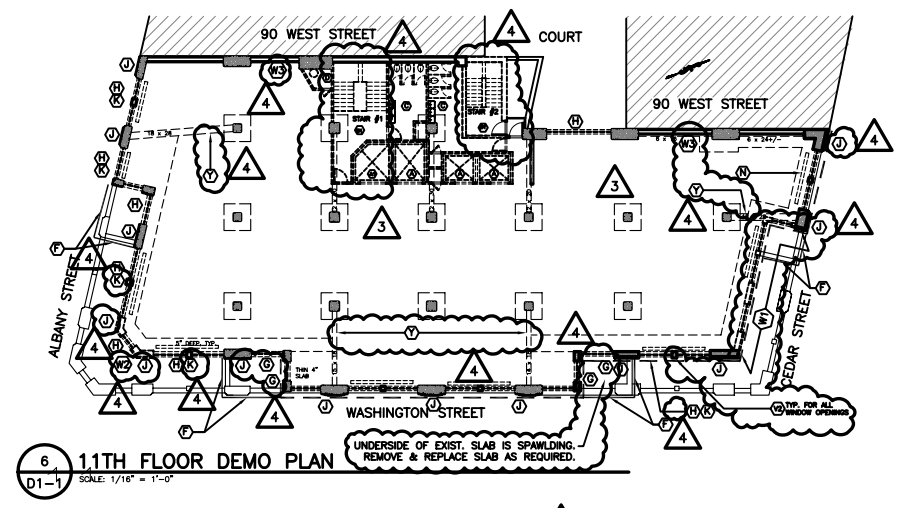
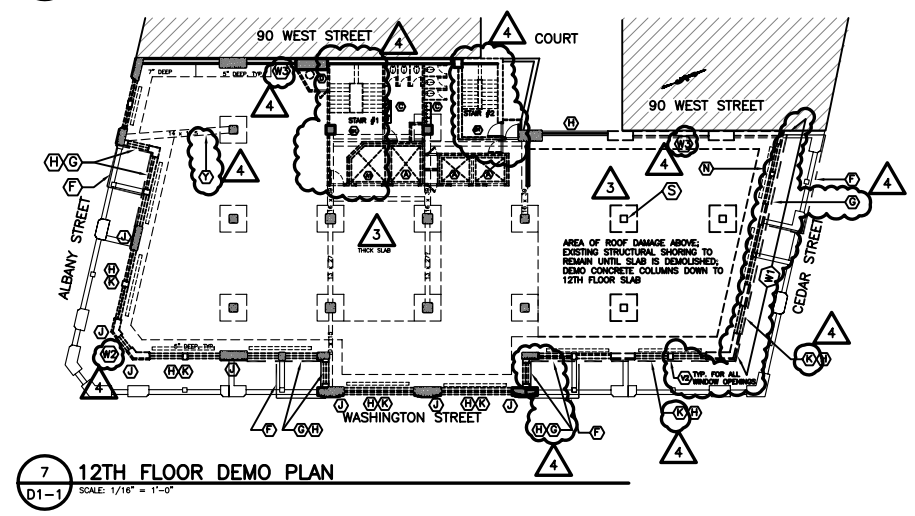
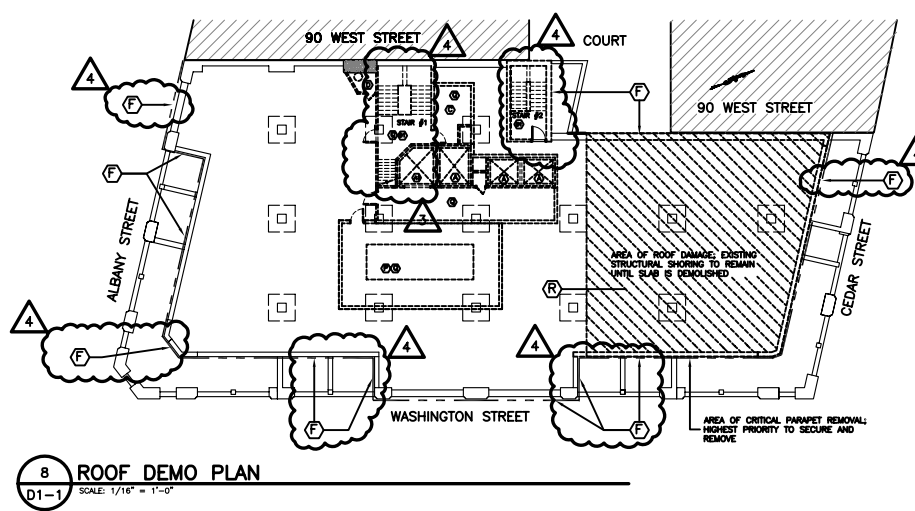
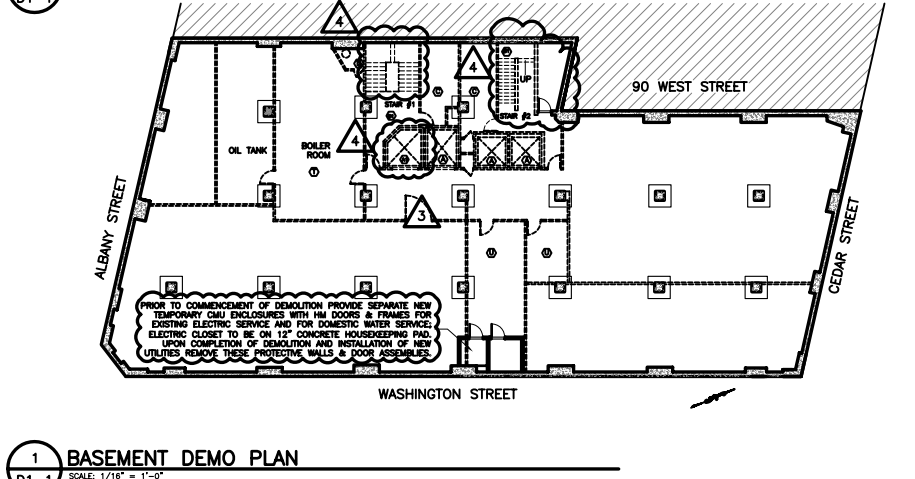
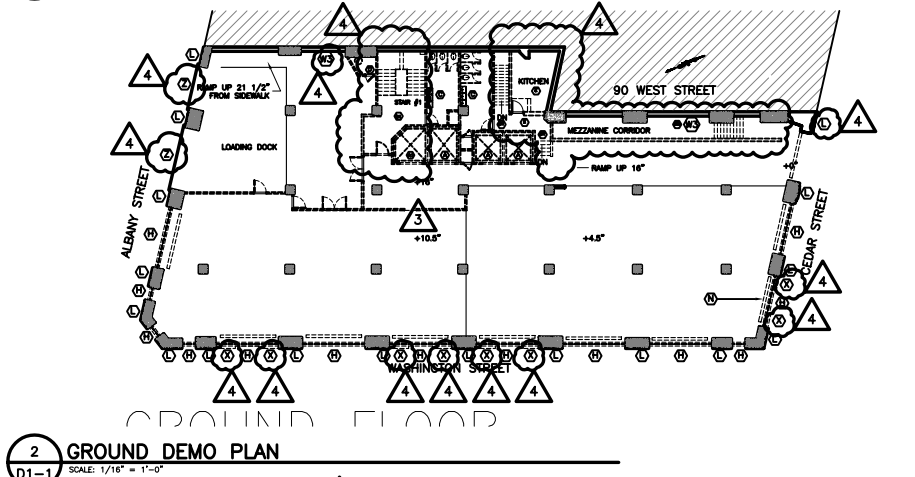
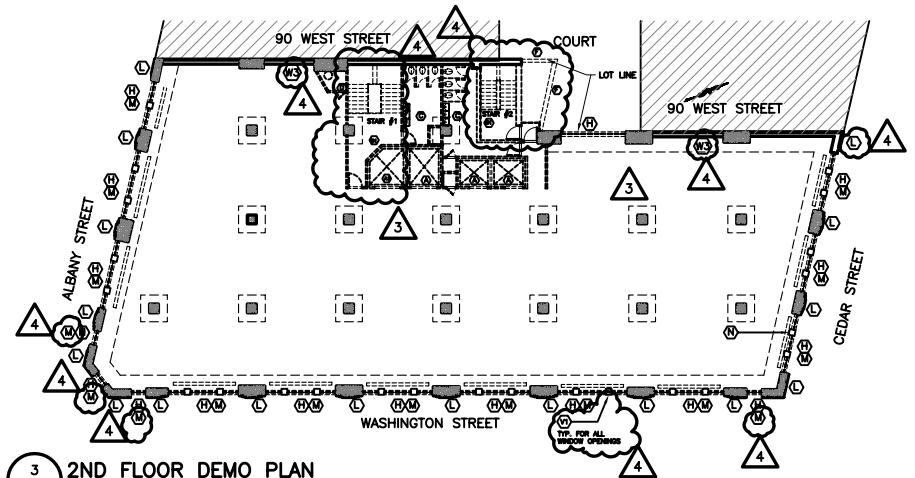
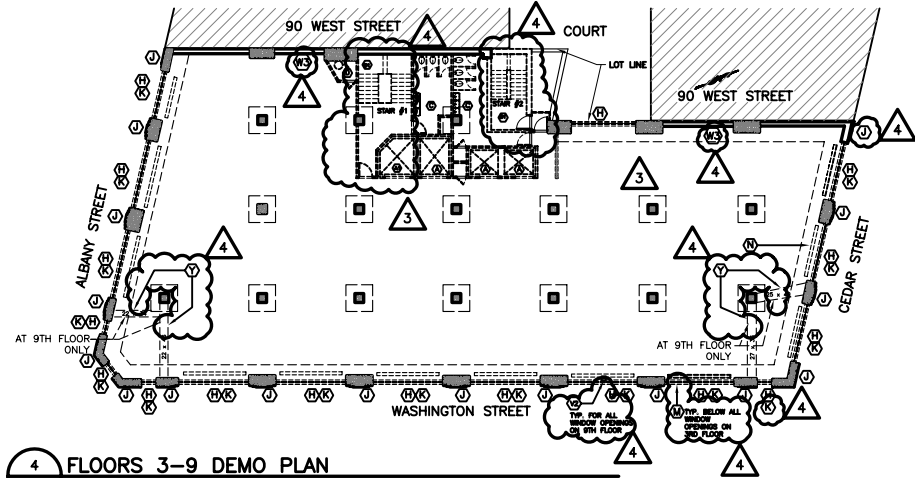
STRUCTURAL ENGINEERS:
SEVERUD ASSOCIATES
CONSULTING ENGINEERS P.C.
38 East 29th Street New York, New York 10016
Tel: 212/986-3700 Fax: 212/689-5440

MEP-PF ENGINEERS:
LORING
CONSULTING ENGINEERS
21 Penn Plaza New York, New York 10001
Tel: 212/563-7400 Fax: 212/563-7382

DRAWING TITLE:
SELECTIVE DEMOLITION
& FACADE RESTORATION
TITLE PAGE

SCALE: AS SHOWN
DRAWN BY: LSS
CHECKED BY: MJK

DRAWING NUMBER:
A1-0



EXISTING ELEVATORS ENCLOSURES AND EQUIPMENT TO BE DEMOLISHED AND REMOVED. PROVIDE OSHA APPROVED RAILINGS AROUND ALL OPEN SHAFTS.

EXISTING FREIGHT ELEVATOR, ENCLOSURE AND EQUIPMENT TO BE DEMOLISHED AND REMOVED. PROVIDE OSHA APPROVED RAILINGS AROUND ALL OPEN SHAFTS. EXIST. EXTERIOR WALL TO REMAIN.

EXISTING FIRESTAIR TO BE DEMOLISHED AND PREPARE FOR NEW INFILL SLAB. REMOVE ALL DOORS, WALLS, RAILINGS, ETC. PROVIDE OSHA APPROVED RAILINGS AROUND ALL OPEN SHAFTS. EXIST. EXTERIOR WALL TO REMAIN.

EXISTING EXIT PASSAGEWAY TO BE DEMOLISHED. REMOVE ALL DOORS, WALLS, RAILINGS, ETC. REMOVE EXIST. STAIRS & RAISED FLOOR SLAB CONSTRUCTION AND PREPARE FOR NEW INFILL SLAB. PROVIDE OSHA APPROVED RAILINGS AROUND ALL OPEN SHAFTS. EXIST. EXTERIOR WALL TO REMAIN.

EXISTING RESTROOMS TO BE DEMOLISHED; REMOVE ALL FIXTURES, PIPES AND WALLS.

EXISTING BOILER FLUE & ENCLOSURE TO BE DEMOLISHED AND REMOVED; PROVIDE OSHA APPROVED RAILINGS AROUND ALL OPEN SHAFTS.

REMOVE EXIST. RAISED/DEPRESSED STRUCTURAL FLOOR SLAB CONSTRUCTION IN ITS ENTIRETY & PREPARE FOR NEW INFILL SLAB CONSTRUCTION TO BE FLUSH W/ ADJACENT FLOOR SLAB LEVEL.

PARAPET / SPANDREL DEMOLITION: REMOVE EXIST. CONCRETE COPING BACK-UP WALL, FACE BRICK, & SHELF ANGLES DOWN TO WINDOW HEAD AT FLOOR BELOW.

REMOVE FACE BRICK AND MASONRY BACK-UP WALL IN ITS ENTIRETY DOWN TO STRUCTURAL CONCRETE SLAB.

REMOVE ALUMINUM WINDOWS & WINDOW FRAMES ON NORTH & SOUTH FACADES (SEE JCL ABATEMENT PACKAGE FOR REMOVAL OF ORIGINAL STEEL CASEMENT WINDOWS AND FRAMES ON EAST FACADE).

EXISTING BRICK PLASTER TO REMAIN: REPAIR AS REQUIRED TO PROVIDE A SOUND SUBSTRATE FOR ANCHORING OF NEW CLADDING.

SPANDREL TO BE REMOVED: REMOVE SILL, FACE-BRICK, BRICK BACK-UP WALL & STEEL LINTEL/SHELF ANGLE AND REINFORCED CONCRETE SPANDREL BACK-UP. EXIST. EDGE OF SLAB TO REMAIN. CUT EXIST. SPANDREL WALL REINFORCING DOWN FLUSH W/ SLAB.

EXISTING CONC. VENEER PANELS TO REMAIN: REPAIR AS REQUIRED TO PROVIDE A SOUND SUBSTRATE FOR ANCHORING OF NEW CLADDING.

REMOVE EXIST. CONC. VENEER SPANDREL PANELS AND NON-STRUCTURAL BRICK BACKUP.

REMOVE ALL EXISTING STEAM PIPES AND PERIMETER RADIATORS FOR ENTIRE FLOOR.

REMOVE WATER STORAGE TANKS AND RELATED DRAINAGE.

REMOVE ROOF BULKHEADS AND CONCRETE STRUCTURE DOWN TO MAIN ROOF STRUCTURE.

REMOVE CONCRETE ROOF SLAB AND CONCRETE PARAPET BACKUP WALL.

REMOVE CONCRETE COLUMNS AND NON-BEARING MASONRY PARTITIONS DOWN TO 12TH FLOOR SLAB.

REMOVE BOILERS AND ASSOCIATED FUEL STORAGE TANKS.

REMOVE EXISTING ELECTRIC SWITCHGEAR AND PANELS.

REMOVE ALL EXIST. MASONRY BACK-UP & CONC. VENEER MULLIONS.

REMOVE ALL EXIST. MASONRY BACK-UP & BRICK VENEER MULLIONS.

REMOVE EXIST. WALL, PIERS, SPANDRELS, ETC. IN ITS ENTIRETY DOWN TO STRUCTURAL SLAB. CM TO COORDINATE W/ STRUCTURAL ENGINEERING DRAWINGS PRIOR TO COMMENCEMENT OF WORK.

REMOVE EXIST. PIER IN ITS ENTIRETY. CM TO COORDINATE W/ STRUCTURAL ENGINEERING DRAWINGS PRIOR TO COMMENCEMENT OF WORK.

REMOVE EXIST. WALL ADJ. TO NEIGHBORING BUILDING AS REQUIRED.

REMOVE EXIST. LOW CONC./MASONRY WALL IN ITS ENTIRETY.

EXIST. CONC. TRANSFER BEAM ABOVE TO REMAIN.

REMOVE EXIST. O.H. DOOR ASSEMBLY.

09-02-06 COORDINATED W/ SCHEMATIC DESIGN

11-08-04 PERMIT RESUBMISSION (CAD DRAWING)

10-04-04 REVISED FOR CONSTRUCTION CHAND DRAWING

07-15-04 FOR BID AND PERMIT

ISSUE	DATE	REVISION
1	07-15-04	FOR BID AND PERMIT

GENERAL NOTES:

- PLANS SHOW APPROXIMATE LOCATIONS.
- BUILDING SHALL REMAIN SEALED THROUGHOUT ABATEMENT PROCESS. UPON COMPLETION OF ABATEMENT, CONTRACTORS MAY REMOVE PLYWOOD WINDOW COVERS IN WORK AREA. RESTORE WINDOW COVERS NIGHTLY AT ALL LOCATIONS WHERE ENTRY TO THE BUILDING IS POSSIBLE. PROVIDE TEMPORARY DUST BARRIERS AS REQUIRED.
- REMOVE ALL ROOF DRAINS, LEADERS, AND SCUPPERS.
- REMOVE ROOFING SYSTEM INCLUDING, BUT NOT LIMITED TO, BALLAST, MEMBRANES, INSULATION, ACCESSORIES, ETC.
- REMOVE ALL EXISTING ROOF TERRACE PAVERS.
- REMOVE ALL EXISTING EXTERIOR LIGHT FIXTURE ASSEMBLIES, INCLUDING BACK BOXES, AND RELATED WIRING BACK TO PANEL.
- ALL STRUCTURAL COLUMNS & CAPITALS SHALL REMAIN U.O.N.
- ALL DROPPED SLAB EDGES & INTEGRAL CONC. BEAMS TO REMAIN U.O.N.
- COORDINATE REMOVAL OF FLASHING W/ ABATEMENT CONTRACTOR & CM.
- COORDINATE REMOVAL OF ROOF DRAINAGE W/ TEMPORARY ROOF.
- SPRINKLER STANDPIPE & DISTRIBUTION TO BE REMOVED.

130 CEDAR STREET
NEW YORK, NEW YORK

SELECTIVE DEMOLITION & FACADE RESTORATION

OWNER:
CEDAR & WASHINGTON STREET ASSOCIATES, LLC

ARCHITECT:
KOENEN ASSOCIATES
ARCHITECTS AND PLANNING CONSULTANTS
5 West 18th Street New York, New York 10011
Tel: 212-206-8333 Fax: 212-633-6476

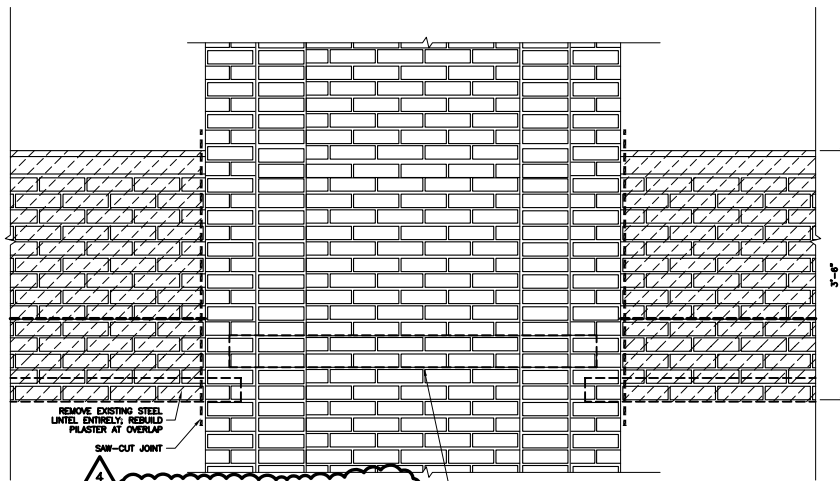
STRUCTURAL ENGINEERS:
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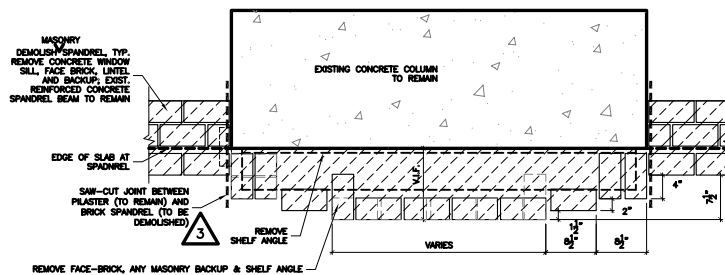
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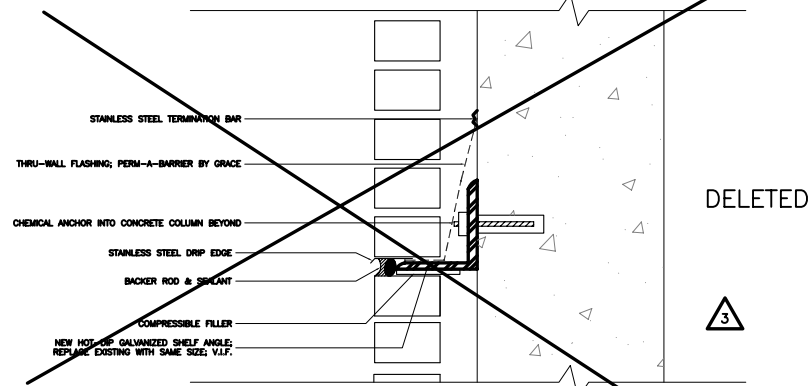
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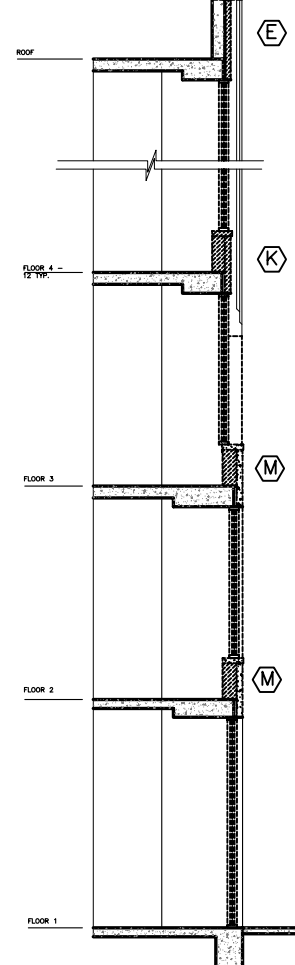
7 DETAIL ELEVATION BRICK PILASTER/SPANDREL
D1-2 SCALE: 1/2" = 1'-0"



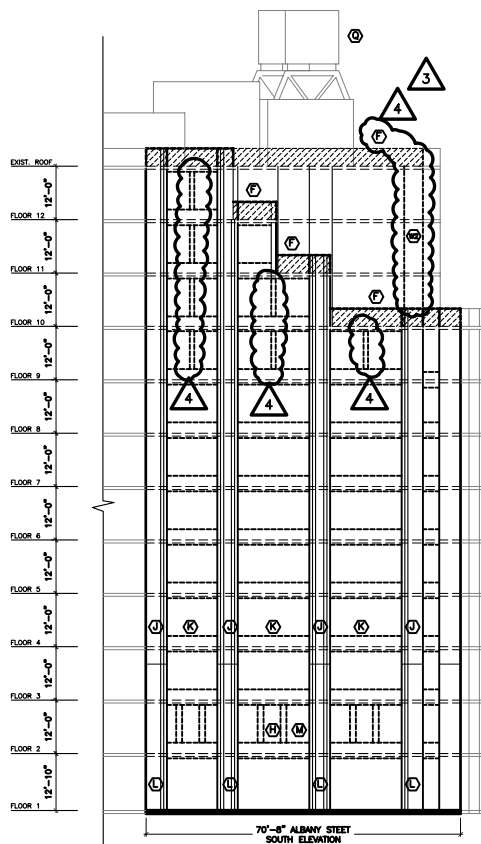
6 DETAIL PLAN BRICK PILASTER/SPANDREL
D1-2 SCALE: 1/2" = 1'-0"



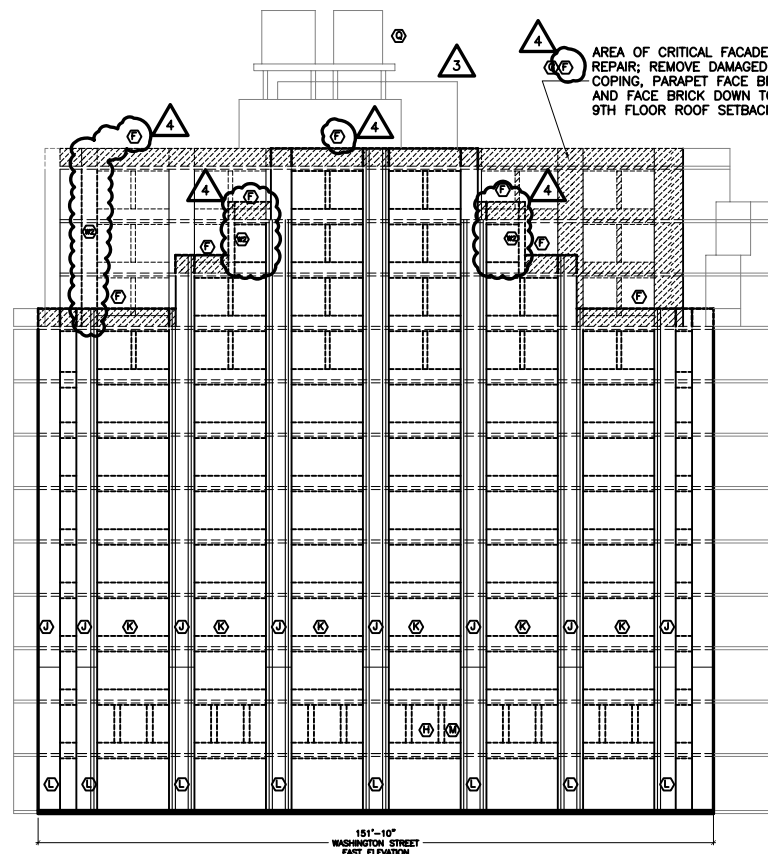
5 TYPICAL SHELF ANGLE REPLACEMENT/RESTORATION
D1-2 SCALE: 3" = 1'-0"



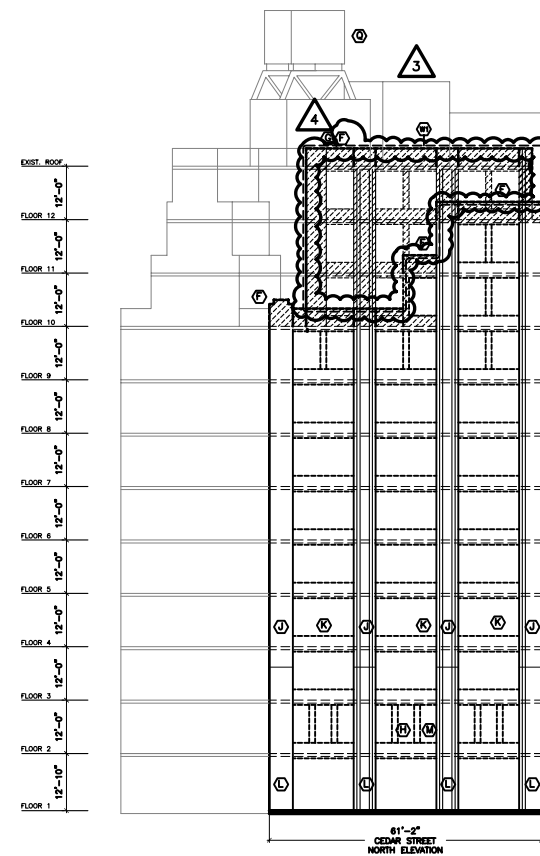
4 TYP. SECTION THRU SPANDREL
D1-2 SCALE: 1/4" = 1'-0"



3 ALBANY STREET FACADE (SOUTH)
D1-2 SCALE: 1/32" = 1'-0"



2 WASHINGTON STREET FACADE (EAST)
D1-2 SCALE: 1/32" = 1'-0"



1 CEDAR STREET FACADE (NORTH)
D1-2 SCALE: 1/16" = 1'-0"

- A** EXISTING ELEVATOR ENCLOSURES AND EQUIPMENT TO BE DEMOLISHED AND REMOVED. PROVIDE OSHA APPROVED RAILINGS AROUND ALL OPEN SHAFTS.
- B** EXISTING FREIGHT ELEVATOR, ENCLOSURE AND EQUIPMENT TO BE DEMOLISHED AND REMOVED. PROVIDE OSHA APPROVED RAILINGS AROUND ALL OPEN SHAFTS.
- C** EXISTING FIRESTAIR TO BE DEMOLISHED AND PREPARE FOR NEW INFILL SLAB. REMOVE ALL DOORS, WALLS, RAILINGS, ETC. PROVIDE OSHA APPROVED RAILINGS AROUND ALL OPEN SHAFTS. EXIST. EXTERIOR WALL TO REMAIN.
- D** EXISTING EXIT PASSAGEWAY TO BE DEMOLISHED. REMOVE ALL DOORS, WALLS, RAILINGS, ETC. REMOVE EXIST. STAIRS & RAISED FLOOR SLAB CONSTRUCTION AND PREPARE FOR NEW INFILL SLAB. PROVIDE OSHA APPROVED RAILINGS AROUND ALL OPEN SHAFTS. EXIST. EXTERIOR WALL TO REMAIN.
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- G** REMOVE EXIST. RAISED/DEPRESSED STRUCTURAL FLOOR SLAB CONSTRUCTION IN ITS ENTIRETY & PREPARE FOR NEW INFILL SLAB CONSTRUCTION TO BE FLUSH W/ ADJACENT FLOOR SLAB LEVEL.
- H** PARAPET / SPANDREL DEMOLITION: REMOVE EXIST. CONCRETE COPING, BACK-UP WALL, FACE BRICK, & SHELF ANGLES DOWN TO WINDOW HEAD AT FLOOR BELOW.
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- K** EXISTING BRICK PILASTER TO REMAIN; REPAIR AS REQUIRED TO PROVIDE A SOUND SUBSTRATE FOR ANCHORING OF NEW CLADDING.
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- N** REMOVE EXIST. CONC. VENEER SPANDREL PANELS AND NON-STRUCTURAL BRICK BACKUP.
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- P** REMOVE WATER STORAGE TANKS AND RELATED DUNNAGE.
- Q** REMOVE ROOF BULKHEADS AND CONCRETE STRUCTURE DOWN TO MAIN ROOF STRUCTURE.
- R** REMOVE CONCRETE ROOF SLAB AND CONCRETE PARAPET BACKUP WALL.
- S** REMOVE CONCRETE COLUMNS AND NON-BEARING MASONRY PARTITIONS DOWN TO 12TH FLOOR SLAB.
- T** REMOVE BOILERS AND ASSOCIATED FUEL STORAGE TANKS.
- U** REMOVE EXISTING ELECTRIC SWITCHGEAR AND PANELS.
- V1** REMOVE ALL EXIST. MASONRY BACK-UP & CONC. VENEER MULLIONS.
- V2** REMOVE ALL EXIST. MASONRY BACK-UP & BRICK VENEER MULLIONS.
- W** REMOVE EXIST. WALL, PIERS, SPANDRELS, ETC. IN ITS ENTIRETY DOWN TO STRUCTURAL SLAB. CM TO COORDINATE W/ STRUCTURAL ENGINEERING DRAWINGS PRIOR TO COMMENCEMENT OF WORK.
- W1** REMOVE EXIST. PIER IN ITS ENTIRETY. CM TO COORDINATE W/ STRUCTURAL ENGINEERING DRAWINGS PRIOR TO COMMENCEMENT OF WORK.
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- X** REMOVE EXIST. LOW CONC./MASONRY WALL IN ITS ENTIRETY.
- Y** EXIST. CONC. TRANSFER BEAM ABOVE TO REMAIN.
- Z** REMOVE EXIST. O.H. DOOR ASSEMBLY.

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09-02-06	COORDINATED W/ SCHEMATIC DESIGN
11-08-04	PERMIT RESUBMISSION (CAD DRAWING)
10-04-04	REVISED FOR CONSTRUCTION CHANG DRAWING
07-15-04	FOR BID AND PERMIT

ISSUE	DATE	REVISION
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130 CEDAR STREET
NEW YORK, NEW YORK

**SELECTIVE DEMOLITION
& FACADE RESTORATION**

OWNER
CEDAR & WASHINGTON STREET
ASSOCIATES, LLC

ARCHITECT
KOENEN ASSOCIATES
ARCHITECTS AND PLANNING CONSULTANTS
5 West 18th Street New York, New York 10011
Tel: 212-206-8333 Fax: 212-633-6476

STRUCTURAL ENGINEERS
SEVERUD ASSOCIATES
CONSULTING ENGINEERS P.C.
38 East 29th Street New York, New York 10016
Tel: 212-986-3700 Fax: 212-689-5449

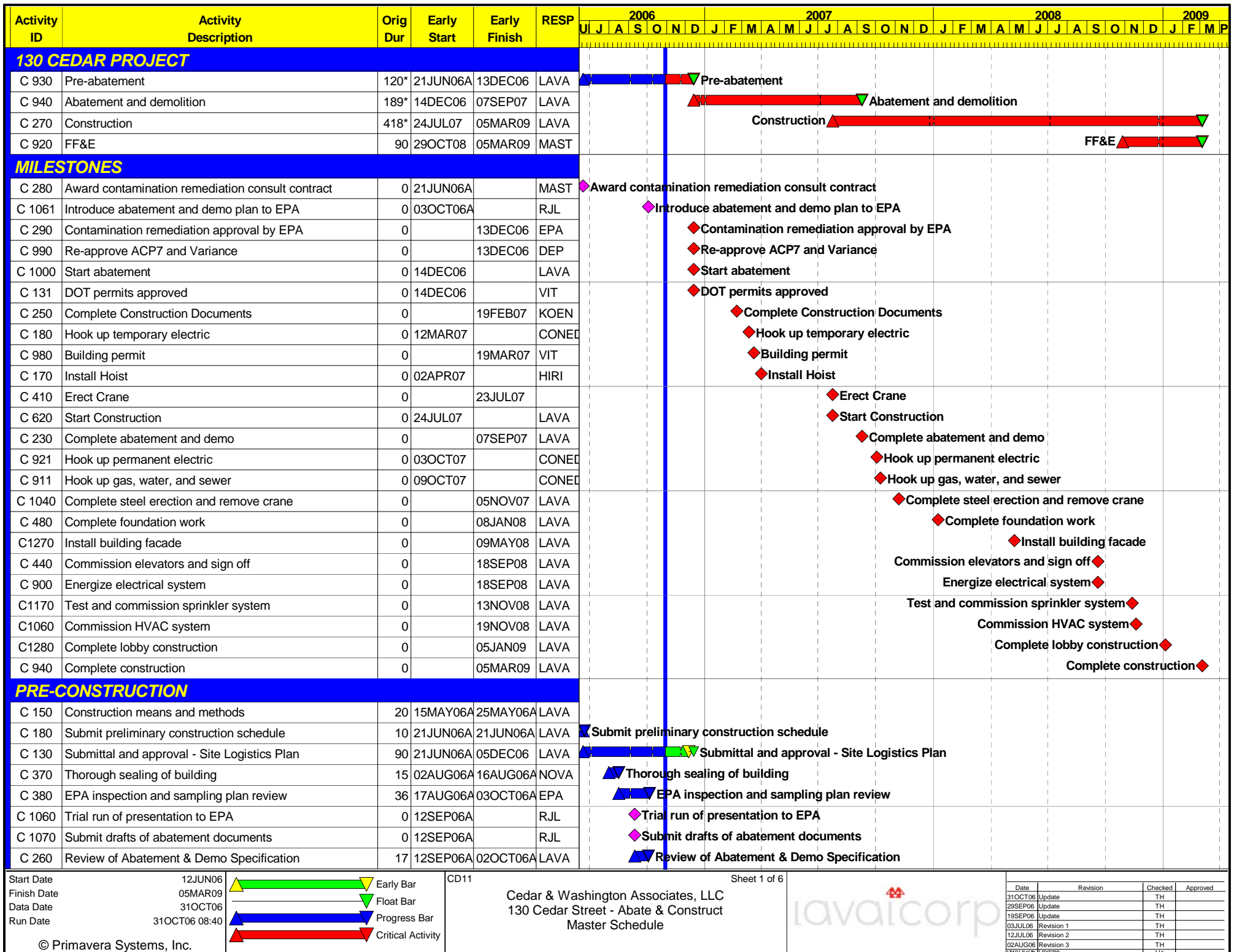
MEP-PF ENGINEERS
LORING
CONSULTING ENGINEERS
51 Penn Plaza New York, New York 10001
Tel: 212-563-7400 Fax: 212-563-7382

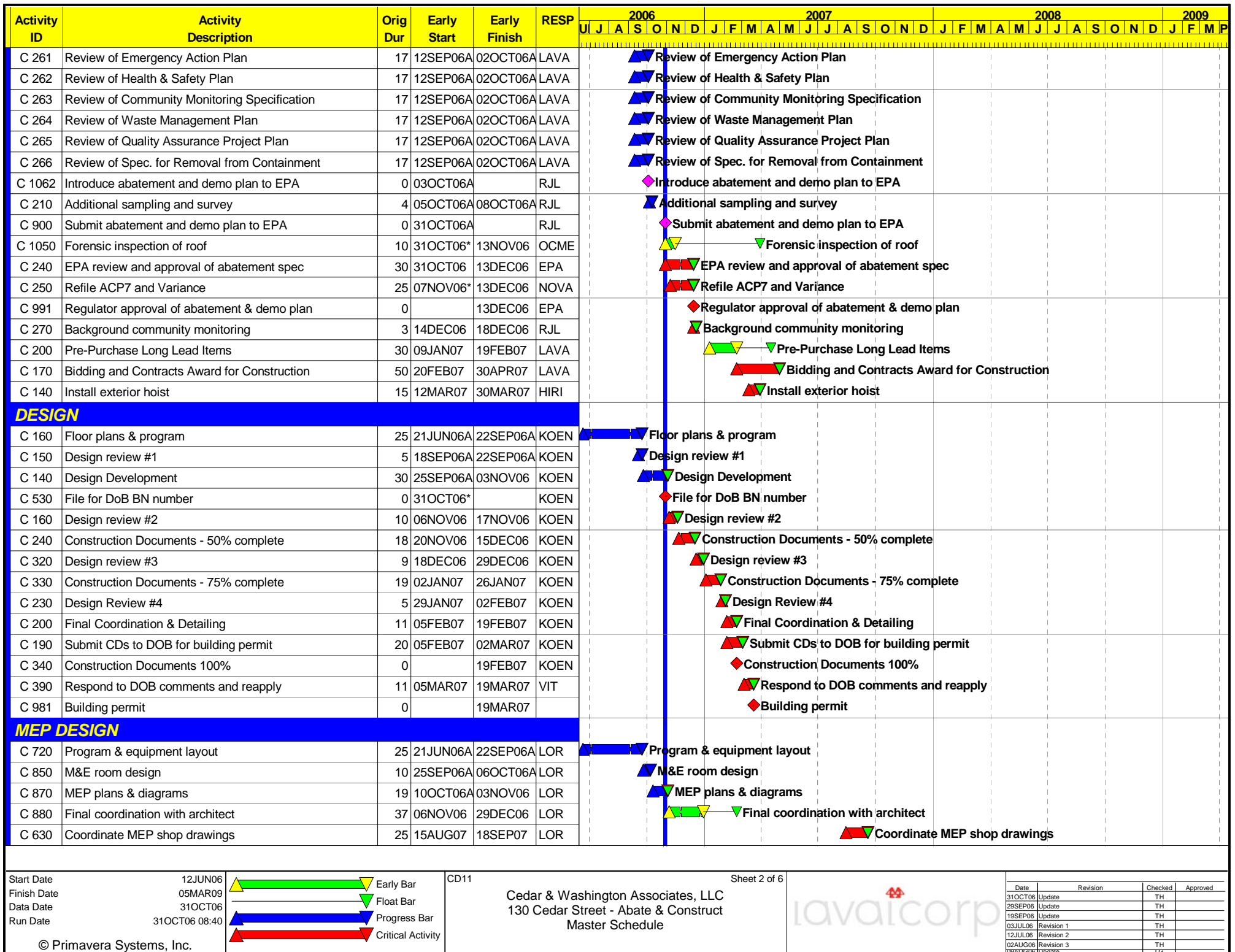
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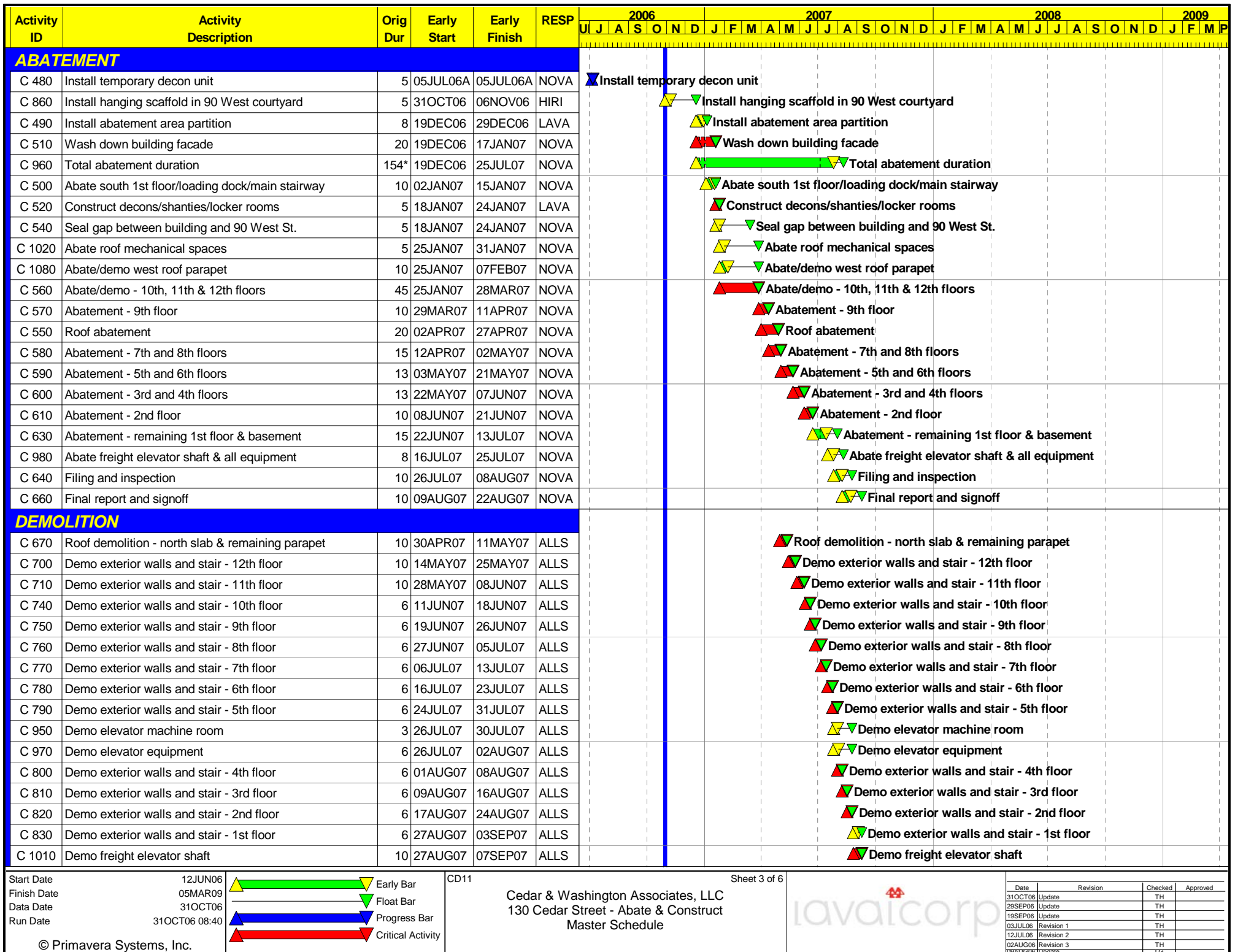
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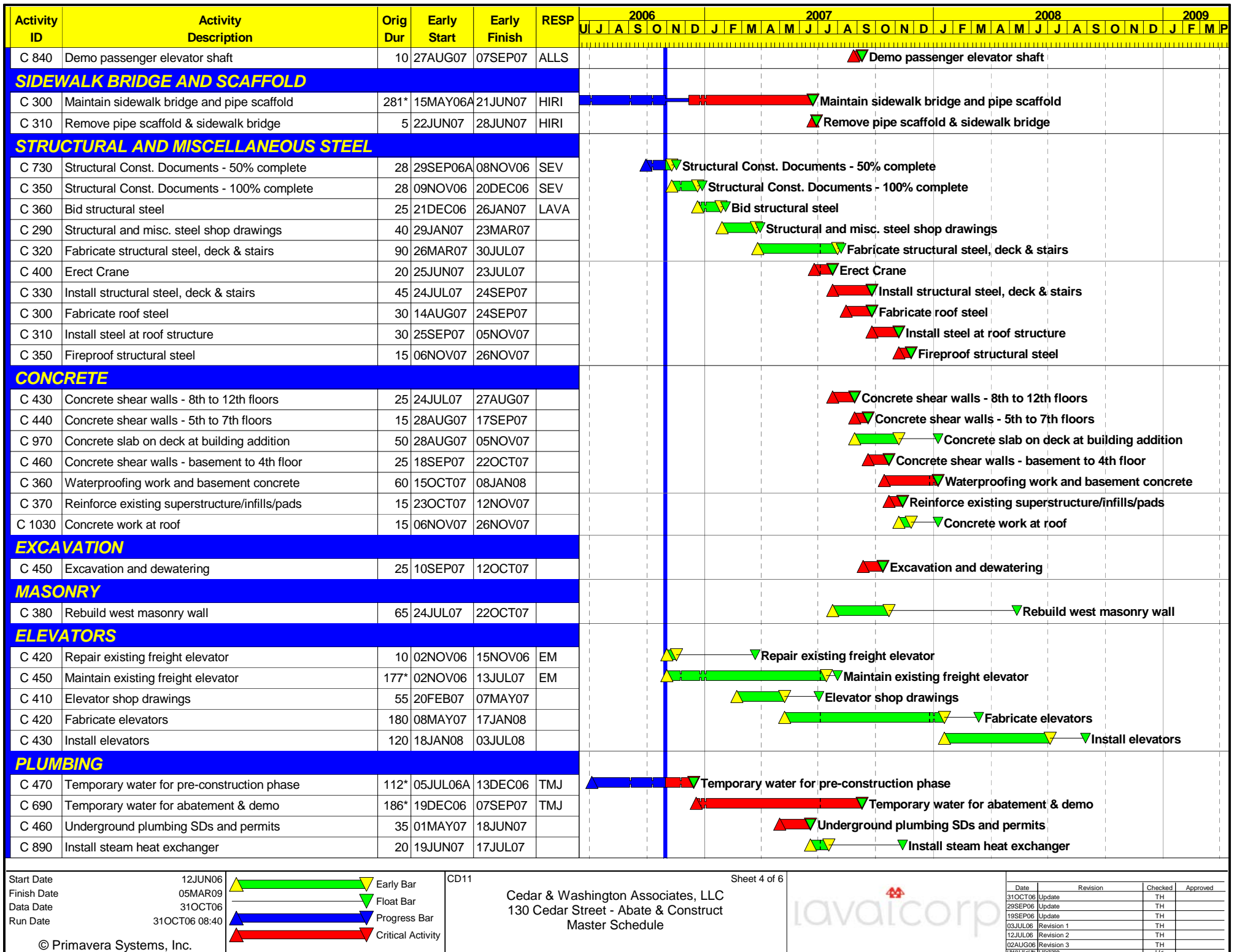
SIGN & SEAL

2.5 Appendix E: Schedule









2.6 Appendix F: Site Logistics Plan

CEDAR ST.

90 West St.

130 Cedar St.

WASHINGTON ST.

130 Liberty St.

123 Washington St.

85 West St.

SITE LOGISTICS PLAN



EXISTING BRIDGE

CRANE ERECTED
PHASE V

EXTERIOR HOIST
ERECTED
PHASE IV

DECON CHAMBERS

SITE LOGISTICS PLAN

40 YARD
CONTAINERS

FIELD OFFICE

DEMOLITION WASTE
LOADOUT

LOADING
DOCK

FULL SIDEWALK CLOSING

ALBANY STREET

LANE CLOSED

LANE CLOSED



ASBESTOS
WASTE

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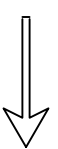
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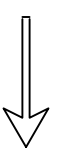
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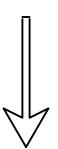
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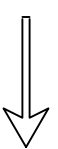
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20'-0"

0'-1'-5 1/2"

1'-6"

2.7 Appendix G: Building Façade Clean Up Procedure

Building Façade Clean-up

A NYSDOL licensed asbestos contractor shall perform Work with NYCDEP and NYSDOL asbestos certified workers.

The contractor performing the cleaning should be experienced in cleaning building facades.

The area below the façade cleaning shall be covered with a layer of polyethylene sheeting. All debris must be collected for disposal as ACM directly upon removal from the surface (i.e., All waste must be double bagged in ACM waste labeled bags). Running water or water runoff on the building façade is not permitted. All water will be channeled via plastic sheeting and dykes to a filter prior to discharge to the sanitary sewer.

Access to the street below the façade cleaning shall be restricted and marked with caution tape. Cleaning shall not be performed during wind speeds greater than 20 mph.

All HVAC systems and air conditioners shall be turned off. All windows shall be closed during the cleaning of the building. Some air conditioners and windows may require sealing with duct tape to prevent water penetration.

All horizontal surfaces and all windows on the façade shall be cleaned of large bulk material by wetting and hand brushing or scraping with non-metallic bristle brushes or non-metallic scrapers, by wet wiping and/or HEPA vacuuming from top to bottom. Only water shall be used for wet wiping and low-pressure washing. Detergents, solvents, additives, and any other chemical-cleaning agents are prohibited. The removed material shall be immediately placed into containers (e.g. bags). Windows shall be wet wiped. Free running water shall not be evident during this procedure. Power for HEPA vacuums shall be supplied through ground fault interrupters.

After completion of debris removal, the specified area shall be carefully washed. A low pressure washing technique, moving from top to bottom shall be employed to minimize water bounce-back. Facades shall be washed with a low-pressure wash not to exceed 250 psi.

At the completion of work, a visual inspection of the abated surfaces and sidewalk shall be performed to verify the absence of visible debris.

An independent NYSDOL licensed third party air-monitoring firm shall perform air monitoring with certified workers.



2.8 Appendix H: Roof Clean Up & Search for Potential Human Remains



Section 2.0 - Appendix H

ROOF CLEAN UP & SEARCH FOR POTENTIAL HUMAN REMAINS:

1. The entire roof shall be considered the work area. All abatement will be performed by NYSDOL licensed contractors with NYC DEP and NYS DOL certified workers.
2. A changing area consisting of two adjacent step-off pads located on the roof immediately adjoining the roof entrance/exit. This area shall consist of a clean pad and a change pad. The clean pad shall be adjacent to the building interior access way (or at the point of entry to the roof for exterior access). The change pad shall be adjacent to the contaminated roof areas. Each pad (change pad and clean pad) shall consist of two layers of 10-mil reinforced plastic on the roof/access way surface and shall be large enough to facilitate changing and decontamination as described herein. A minimum of 4' x 4' is recommended, though the exact configuration will be specified to the roof.
3. Workers shall first step from the building interior (or exterior at the point of entry to the roof) directly onto the clean pad. On the clean pad, each worker shall be double suited with disposable coveralls, plastic booties, gloves, and head coverings. Rubber boots may be used instead of the plastic booties. The boots shall be wet wiped and HEPA vacuumed prior to leaving the roof. Each worker shall wear a minimum of a half-face air-purifying respirator equipped with HEPA cartridges.
4. All penetrations (windows, vent, ducts, grills, etc.) at the roof within 10 feet of the specified roof area included in the cleaned up shall be cleaned by wet methods/HEPA vacuum and sealed with 6-mil polyethylene sheeting.
5. Searchers who are involved in search activities within each regulated area will be considered Authorized Visitors, and will receive asbestos awareness training at a minimum prior to entry into the regulated area. The search for human remains and associated artifacts will be directed by OCME personnel.

6. Roof ballast cleanup shall begin at the entrance/exit and proceed in a path working away from the entrance/exit. OCME personnel will be responsible for coordinating the specific areas to be searched and washed. Water shall be the primary engineering control to minimize the potential for fiber release.
7. The gravel/stone/debris will be placed in a mesh assembly (consisting of two sieve sizes with opening of $\frac{3}{4}$ " and $\frac{1}{8}$ " or $\frac{1}{16}$ ") in order to wash it and search for possible human remains. The clean-up and search operation will occur simultaneously. OCME will provide the sieving screens and will determine the appropriate size mesh for the search. No ballast will be dumped from the screens until it has been cleared of possible human remains and associated artifacts by OCME personnel. As OCME personnel will be working along side the other workers, the same level of PPE is required. Water shall be collected, filtered through a 5 micron filtration system, and discharged into the drain/sewer as applicable.
8. Throughout the procedure, all personnel entering or exiting the roof shall observe the personal decontamination practices. Attention shall be paid to limiting unnecessary walking on or disturbance of material on the roof. These personal decontamination procedures shall be strictly adhered to, in order to minimize the potential for spreading contamination to the interior of the buildings.
9. After search of ballast is completed and approval given by OCME, the ballast will be replaced to their original location. OCME will be responsible for the decontamination of any material removed from the rooftop.

Air monitoring shall be performed by a NYSDOL licensed Third Party Air Monitoring firm with certified workers throughout the clean-up. At a minimum three (3) samples will be collected continuously during the clean up. If at anytime sampling shows concentrations above 70 s/mm² all work will stop and engineering controls applied. That is, increased wetting of materials.



Section 2.0 - Appendix H

ROOF CLEAN UP & SEARCH FOR POTENTIAL HUMAN REMAINS:

1. The entire roof shall be considered the work area. All abatement will be performed by NYSDOL licensed contractors with NYC DEP and NYS DOL certified workers.
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3.0 Specification for the Removal of the Building from Containment



Specification for the Removal of the Building from Containment

**Abatement and Selective Demolition
130 Cedar Street
New York, NY 10006**

October 2006

Prepared by:
RJ LeeGroup, Inc.
350 Hochberg Rd.
Monroeville, PA 15146
www.rjlg.com

**Prepared for:
Masterworks Development Corporation
56 West 45th Street, 4th Floor
New York, NY 10036**

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Specification for the Removal of the Building from Containment

1.0 Introduction

The building located at 130 Cedar Street, New York, NY 10006 ("the Building") will be considered ready for selective demolition phase of the project, when the Building is visually clean of all dust, all interior surfaces have been encapsulated with a colored encapsulant, and interior air clearance testing indicates that concentrations of the analytes listed below have been reduced to the levels specified. All visual clearance and air testing will be conducted by the Environmental Consultant. Where necessary, a "White Glove Test" will be performed to determine visual clearance. In the event that release from containment criteria is not met, all costs associated with re-testing and re-cleaning shall be borne by the Contractor.

2.0 Clearance Sampling

Acceptance Air Criteria: The Building can be removed from containment and the abatement phase will be completed when area air measurements, performed using aggressive air sampling procedures which re-suspend residual settled dusts, are at or below each of the following airborne concentrations in every sample, respectively, for the metals noted below and for asbestos. Air testing for asbestos shall be in accordance with applicable regulations and applicable permits and variances for this project. If any sample is above any of these levels, the abatement phase will be considered incomplete and the affected areas shall be re-cleaned. Clearance levels for metal analytes were selected at 50% of the applicable American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLV). Results of aggressive air testing below these clearance levels will provide adequate protection for workers without respiratory protection and should minimize any off-site emissions from interior dust-associated contaminants.

Table 1. Clearance Levels for Metals

Metal	Clearance Level ($\mu\text{g}/\text{m}^3$)	Basis (TLV)
Antimony	250	Antimony & compounds
Barium	250	Barium & soluble compounds
Beryllium	1.0	Beryllium & compounds
Cadmium	5	Cadmium & compounds – Inhalable fraction
Chromium (III)	250	Chromium (III) inorganic compounds
Copper	500	Copper dusts and mist
Lead	25	Lead and inorganic compounds
Manganese	100	Manganese and inorganic compounds
Mercury	12.5	Mercury, elemental
Nickel	50	Nickel, soluble compounds – Inhalable fraction
Zinc	1,000	Zinc oxide – Respirable fraction

2.1 Metals – Air Samples

Sample collection will be performed in accordance with NIOSH 7300, “Elements by ICP”. Sampling will be conducted for a minimum of two hours utilizing a flow rate minimum of four liters/minute. The air sampling volume will be a minimum of 500 liters.

Mercury monitoring utilizing a Lumex direct read instrument along with a data logging laptop will be utilized, along with inductively coupled plasma/mass spectrometry (ICP-MS) to obtain mercury levels. The Lumex must be utilized to obtain sensitivity levels below the clearance criteria established.

The number of samples per containment area as determined by the Environmental Consultant) will be a minimum of five (5).

2.2 Asbestos – Air Samples

Asbestos air sample collection will be performed in accordance with AHERA 40 CFR Part 763, “Asbestos” and in accordance with applicable regulations and permits and variances for this Project. Acceptance Criteria: Every sample indicates an airborne concentration of asbestos fibers of 70 structures per mm^2 or less. If any sample is above this level, then the abatement phase will be considered incomplete and the affected areas shall be recleaned. The number of samples per containment area as determined by the Environmental Consultant will be not less than five (5) samples per floor. The elevator shaft and stair wells will have to be cleared and sampled separately from floor clearance activities.

2.3 Lead – Wipe Samples

Wipe samples will be taken and analyzed for lead to assure the removal of lead containing paint and materials. The clearance level for these wipes is 400 $\mu\text{g}/\text{ft}^2$. This is based upon the USEPA 2005 value for infrequently accessed surfaces. The

level of 400 ug/ ft² is higher than the allowable level for accessible surfaces such as floors (40 ug/ft²), however, the post abatement surfaces in the Building will be rendered inaccessible during renovation. If any sample results in an exceedance, the affected area will either be re-cleaned or removed as part of the abatement phase.

- The size of the area determines the minimum number of samples collected. A minimum of five (5) samples will be collected for areas less than 5,000 ft²; seven (7) for areas between 5,000 ft² and 10,000 ft²; ten (10) for areas larger than 10,000 ft².

The Environmental Consultant may determine to collect additional samples, based upon the surface area and materials present.

2.4 Asbestos – Microvac Samples

Microvac samples will be taken and analyzed for asbestos to assure the removal of ACM. The clearance level for these samples will be 50,000 structures per cm². The clearance levels are consistent with criteria published in the *USEPA November 2005 World Trade Center Indoor Dust Test and Cleaning Program Plan*. According to the USEPA, residential units with surface sampling results from infrequently accessed areas below the selected cleanup levels will not be recommended for cleanup. If any sample results in an exceedance, the affected area will either be re-cleaned or removed as part of the abatement phase.

- The size of the area determines the minimum number of samples collected. A minimum of five (5) samples will be collected for areas less than 5,000 ft²; seven (7) for areas between 5,000 ft² and 10,000 ft²; ten (10) for areas larger than 10,000 ft².

The Environmental Consultant may determine to collect additional samples, based upon the surface area and materials present

4.0 Specification for Community Air Monitoring



Specification for Community Air Monitoring

**Abatement and Selective Demolition
130 Cedar Street
New York, NY 10006**

October 2006

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Specification for Community Air Monitoring

1.0 Introduction

The community air monitoring and observations of visible emissions during the abatement and selective demolition of the building located at 130 Cedar Street, New York, NY 10006 ("the Building") will be performed according to methods or their equivalents contained in this specification.

2.0 Environmental Air Monitoring

The objective of environmental (ambient) air monitoring during this project is to monitor air quality and to gauge migration, if any, of contaminants from the site during building abatement and selective demolition. The goal of the air sampling is to ensure that the abatement and selective demolition operations do not have a negative impact on the surrounding community. Air monitoring is to be conducted during two phases of this project:

- Abatement phase during which selected contaminants will be cleaned to at or below specified levels and tenant fit out and furniture will be removed from the Building.
- Selective demolition phase during which the interior and exterior walls will be removed leaving the concrete columns and floor.
- Air monitoring will be conducted along the property perimeter and potential emission areas.

2.1 Abatement Phase

During each work shift, the Environmental Consultant will be tasked with observing the Building's containment barriers and exterior. Special attention will be paid to established critical barriers and area(s) of high emission potential to identify any visible emissions.

If any visible emission is noted exterior of the work area the Environmental Consultant will perform an immediate evaluation of in-place engineering controls for the emission location. The evaluation may include, but is not limited to, work activities and smoke testing of the critical barriers. Any damaged or malfunctioning engineering control will be repaired immediately. The work will be stopped until engineering controls are repaired or determined to be functioning properly.

2.2 Selective Demolition Phase

During each work shift, the Environmental Consultant will observe demolition operations to monitor visible dust in the air and suppression measures being applied by the demolition contractor. The Environmental Consultant may,

depending on the severity and duration of dust condition, order a stoppage of the work or require modified work practices to reduce visible dust emission.

2.3 Notification

The EPA Region 2 office and NYCDEP will be notified as promptly as reasonably possible of any visible emissions observed by the Environmental Consultant to cross the property line of the Building, and the Environmental Consultant will subsequently promptly advise the EPA Region 2 office and NYCDEP of the corrective actions taken.

2.4 Air Sampling and Analytical Methodology

Analysis and sampling methods used in this Project will follow EPA or National Institute of Occupational Safety and Health (NIOSH) protocols as guidelines or other standard methodologies. Modifications to sampling and analysis protocols listed below may be made as required to permit an accurate and precise analysis. Generally, sampling will be performed once each 24 hour work period, except for asbestos transmission electron microscopy (TEM) samples, which will be taken for the duration of every shift during the abatement phase. Real-time particulate monitoring will be on a continuous basis. Instantaneous mercury readings will be obtained to evaluate the air quality around the work site at multiple locations each work day. Table 1 sets forth a more detailed explanation of the sample collection and analysis protocols.

Table 1. Sampling Methodologies

Analyte	Method	Sample* Rate (lpm)	Duration Per Day	Comments
Metals				
Antimony, Barium, Beryllium, Cadmium, Chromium, Copper, Lead, Manganese, Nickel, and Zinc	NIOSH 7300	2 to 4	24 hours	MCE Filter, ICP-MS Analysis
Mercury	Ohio Lumex AA, Direct Read	20	Twice per shift at each monitor site	Elemental (vapor) Mercury Analysis
Particulate and Dust				
Asbestos	NIOSH 7402	2-4	Each Shift	Analysis via AHERA mod. methodology
Particulate PM 10	EBAM (Electronic Beta Attenuation Monitor)	16.7	24 hours	Real-time analysis
Particulate PM 2.5	EBAM (Electronic Beta Attenuation Monitor)	16.7	24 hours	Real-time analysis
Crystalline Silica and Respirable Dust	NIOSH 0600/7500	2.5	24 hours	SKC Aluminum cyclone
WTC Dust (includes vitreous fibers & asbestos)	NIOSH 7402 using polycarbonate filter	2-4	24 hours	SEM/EDS analysis of PCM filter

* lpm = liter per minute, sampling rates may be modified to optimize filter sample loading for microscopy and/or gravimetric related analyses.

Asbestos sample collection will be performed in accordance with NIOSH 7402, "Asbestos by TEM". Asbestos analysis will be performed utilizing TEM analysis specified in 40 CFR Part 763, Asbestos Hazard Emergency Response Act, (AHERA), with the following modifications:

- The sensitivity on TEM air samples will be less than 0.002 s/cc.
- Both length and width of all asbestos fibers will be recorded.
- Confirmation by EDS and/or SAED will be performed for each fiber analyzed.
- The morphology of the fibers will be noted and recorded.

Metals sampling and analysis will be performed following NIOSH 7300 "Elements by ICP" methodology with the following modifications:

- ICP-MS will be utilized when analyzing metal air sample filters. Rationale: ICP-MS has an approximate 100X (times) lower detection limit than standard ICP-AES analysis specified in NIOSH 7300.
- Metals to be analyzed by ICP-MS and reported are: Antimony, Barium, Beryllium, Cadmium, Chromium, Copper, Lead, Manganese, Nickel, and Zinc.
- A hot block/acid digestion will be used.

Real-time air monitoring for mercury will be performed utilizing a Lumex RA 915+ direct read instrument. The readings will be entered into the PDA program for inclusion with the daily download of sample collection data.

The Lumex will be utilized to obtain detection levels below established air contaminant criteria. At a minimum, mercury readings will be taken twice per shift at the fixed air monitoring locations (seven during the abatement phase and three during the selective demolition phase) once after all shift air samples are initialized and once before the shift samples are collected. At the discretion of the Environmental Consultant and as daily site conditions may dictate, additional mercury readings may be taken.

Airborne dust and particulate at the Building will be monitored using sample collection and real-time air monitoring. Real-time air monitoring for PM-2.5 and PM-10 will be accomplished with direct reading particulate in air monitors. Data from real-time EBAM particulate monitors will be data logged. Samples for WTC dust and particulate will be collected in accordance with NIOSH method 7402. Respirable dust and crystalline silica sampling will be performed according to NIOSH Method 0600 protocol with analysis following NIOSH Method 7500 (XRD).

3.0 Community Air Monitoring

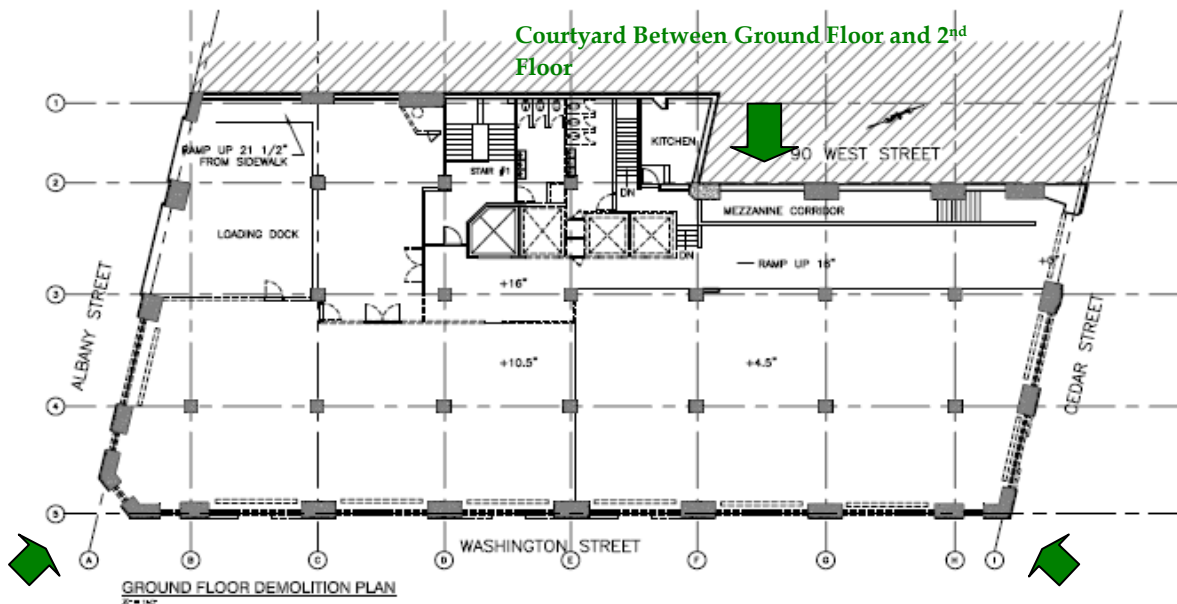
Four (4) exterior asbestos sampling locations will be placed on the street level. The following sample locations, along with two blanks (asbestos) and one blank (metals) will be sampled daily as part of the NYCDEP requirements included in

community outside the work area (OSWA) monitoring program. The community monitoring program will be performed at the four (4) locations six days per week (excluding Sunday unless Sunday is a work day in which case monitoring will be done on Sunday). Four (4) analytes will be sampled and submitted for analysis (metals, asbestos, crystalline silica, and airborne mercury - one for each work day period, from each community monitoring location, during each work day, including Sunday if it is a work day. The four community monitoring locations to be sampled during the abatement phase are:

- Northeast corner, at street level (corner of Washington and Cedar Street)
- Southeast corner, at street level (corner of Albany and Washington Street)
- Courtyard between 130 Cedar St. and 90 West St. at street level
- Elevated Air Monitoring Station, initially on roof, middle of Washington St. facade. This station will be lowered with scaffold per the demolition schedule.

Prior to the initiation of abatement, baseline community air monitoring will be performed for a ten day period at the four monitoring stations for each of the selected analytes to evaluate the background air quality at the Building.

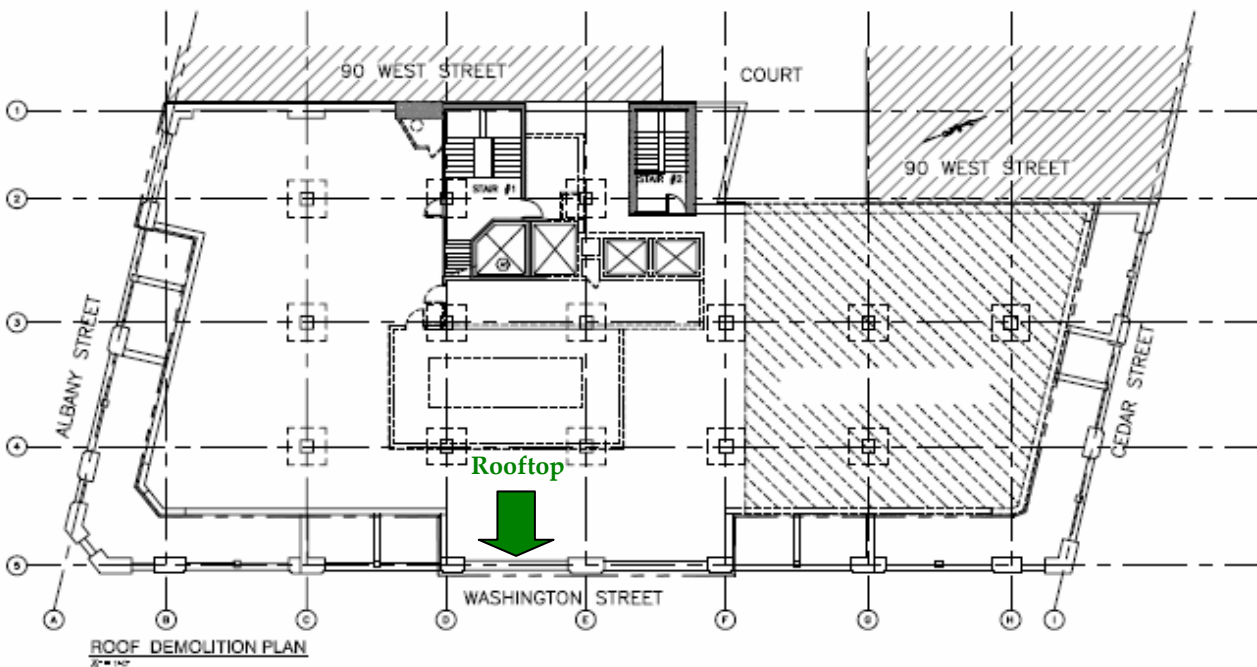
Street Level Community Air Monitoring Locations



Southeast Corner Street Level

Northeast Corner Street Level

Elevation - Air Monitoring Station Location



4.0 Abatement Phase Air Monitoring

Air monitoring of airborne asbestos fibers for NYCDEP ACP 7 filing OSHA is included in this phase of the work. Worksite asbestos sampling locations include:

- Porous Material Waste Decon Clean Room
- Non-Porous Material Waste Decon Clean Room
- Personnel Decon Clean Room
- Shanty (location may change daily)
- In any occupied area that is adjacent to an abatement barrier

Six (6) air samples will be collected and analyzed daily from OSHA locations for asbestos by TEM. Sampling will be conducted on Sunday if Sunday is a work day.

5.0 Selective Demolition Phase Air Monitoring

During the selective demolition phase, the community air monitoring program will be performed at four (4) locations five days per week (excluding Saturday and

Sunday unless active work is being performed). The four (4) community monitoring locations to be sampled during the Selective Demolition Phase are:

- Northeast corner, at street level (corner of Washington and Cedar Street)
- Southeast corner, at street level (corner of Albany and Washington Street)
- Courtyard between 130 Cedar St. and 90 West St. at street level
- Elevated Air Monitoring Station, initially on roof, middle of Washington St. facade. This station will be lowered with scaffold per the demolition schedule.

Parameters to be sampled and analyzed from each selective demolition phase location are: Asbestos (TEM), Crystalline Silica, Metals (ICP-MS) and airborne mercury vapor. One metals and one asbestos blank will be collected daily. A summary of the selective demolition phase sampling and analysis is contained in Table 2.

Table 2. Selective Demolition Phase Sampling and Analysis Summary

Location	Parameter(s)	Sample Frequency	Method	Comments
Bldg Area	Mercury	Daily, except Saturday and Sunday*	Lumex, portable mercury analyzer	Lumex results are real-time data logged
Bldg Area	Particulate (Visible dust emissions)	Daily, except Saturday and Sunday*	Visual observation	
Bldg Perimeter - four fixed locations	Particulate PM-2.5, PM-10	Daily, except Saturday and Sunday*	Electronic Beta Attenuation Monitor (EBAM)	
Bldg Perimeter - four fixed locations	Asbestos Silica Metals	Daily, except Saturday and Sunday*	TEM XRD ICP/MS	Sampling duration may be modified**
Blanks	Asbestos (1) Silica (1) Metals (1)	Daily, except Saturday and Sunday*	TEM XRD ICP/MS	

* Monitoring will occur on Saturday and Sunday if they are days when Work is occurring

** Sampling duration and/or flow rate may be modified to provide optimum analyte loading for analysis based on results of ongoing analysis. Initial sampling flow rates will be according to rates prescribed in the sampling method.

Note: Two daily air samples will be collected at each of four sampling locations (asbestos, silica, metals) for any day that work is conducted. That is, a sample for each analyte will be collected and analyzed for each work shift.

6.0 Evaluating Results

The Target Air Quality Levels and EPA Site Specific Trigger Levels for the Building are provided in Table 3.

Table 3. Target Air Quality Levels and EPA Site Specific Trigger Levels

Analyte	Target Air Quality Levels	EPA Site Specific Trigger Levels
Metals		
Antimony	5 ug/m ³	14 ug/m ³
Barium	5 ug/m ³	5 ug/m ³
Beryllium	0.02 ug/m ³	0.2 ug/m ³
Cadmium	0.04 ug/m ³	4 ug/m ³
Chromium	0.6 ug/m ³	60 ug/m ³
Copper	10 ug/m ³	100 ug/m ³
Lead	1.5 ug/m ³	5 ug/m ³
Manganese	0.5 ug/m ³	0.5 ug/m ³
Mercury	0.3 ug/m ³	3 ug/m ³
Nickel	0.2 ug/m ³	28 ug/m ³
Zinc	16 ug/m ³	161 ug/m ³
Particulate and Dust		
Asbestos (PCMe fibers)	0.00028 f/cc	0.028 f/cc
Particulate PM-10 (24 hour average)	150 ug/m ³	150 ug/m ³
Particulate PM-2.5 (24 hour average)	40 ug/m ³	65 ug/m ³
Respirable Silica (crystalline)	10 ug/m ³	10 ug/m ³

With the exception of the 24-hour NAAQS for PM_{2.5} and PM₁₀, the Target Air Quality Levels described herein are based on average exposures during the Building abatement and demolition. Therefore, the following criteria will be used to evaluate the monitoring data collected pursuant to this program:

- Any 24-hour PM_{2.5} and PM₁₀ value in excess of the 24-hour NAAQS will be considered an “exceedance” and the actions described below will be taken.
- Any 24-hour sample of analytes other than PM_{2.5} and PM₁₀ in excess of three times the Target Air Quality Level will be considered an exceedance and the actions described below will be taken.
- Following the first week of sampling, a “rolling average” will be established based initially on the first week’s results (i.e., average of the first five or six days of testing), to which will be added daily values as results are received from the laboratory. A rolling average value for any analyte in excess of the relevant Target Air Quality Level will be considered an exceedance and the actions described below will be taken.

Exceedance of the established Target Air Quality Levels for any analyte will result in an evaluation of engineering controls and work techniques in the source area. This evaluation shall include but not be limited to the evaluation of work activities that may be causing the exceedance, smoke testing of the critical barriers in question, and inspection and repair of any faulty critical barriers.

Exceedances of EPA Site Specific Trigger Levels will result in a stoppage of work associated with the exceedance until an evaluation of emission controls is performed and corrective action is in place. The EPA Site Specific Trigger Levels are applicable to daily sampling results. If any of the daily sampling results exceed the EPA Site Specific Trigger Levels, then notification must be made to the USEPA Region 2 office and the NYCDEP. Work will be reinitiated once the USEPA Region 2 office has agreed to the corrective action(s) proposed to prevent the potential for exceedances in future work.

6.1 Notification

The US EPA Region 2 office and the NYCDEP will be notified as promptly as reasonably possible of any exceedance of either a Target Air Quality Level or an EPA Site Specific Trigger Level exceedance and will be notified promptly of any corrective actions taken. Notification and the nearest time (before and after) analytical results will be provided to EPA and NYCDEP in the event of unforeseen power outages that interrupt the real-time monitoring devices.

6.2 Monitoring Data

All sampling results collected pursuant to this specification, in suitable electronic form, will be provided to the USEPA Region 2 office daily on each working day. In addition, all Meteorological data will be collected from a nearby National Weather Service (NWS) station and uploaded daily.

5.0 Health and Safety Plan



Health and Safety Plan

**Abatement and Selective Demolition
130 Cedar Street
New York, NY 10006**

October 2006

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Health and Safety Plan

1.0 Introduction

This Health and Safety Plan (HASP) has been prepared to protect the health and safety of all personnel working in, on, and around the building located at 130 Cedar Street in New York, NY 10006 ("the Building") until such point that the environmental restoration of the Building is complete. The requirements in this document were necessitated by the physical, chemical, and biological hazards produced in the Building as a result of the events of September 11, 2001 (WTC Event).

The WTC Event and its aftermath resulted in damage to the Building's windows and exposed the Building interior to dust, debris, and smoke from the WTC site. These residues expose personnel working in the Building to the risk of exposure to potential hazardous materials in those residues. The hazardous materials identified in adjacent buildings in those residues include asbestos, mercury, lead, cadmium, chromium, zinc, polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), and the group of combustion products collectively known as polychlorinated dibenzo dioxins and furans.

This HASP sets out organizational and procedural safeguards to alert personnel working in the Building to these hazards and to limit their exposure to these hazards. The HASP is based on current knowledge of conditions in the Building and is intended to be a flexible document that may be updated as new information becomes available and as conditions change in the Building.

This HASP is a supplement to and shall be followed in conjunction with the General Contractor's Site Safety Plan and the Emergency Response Plan. All abatement workers must comply with worker protection per OSHA, NYCDEP and NYSDOL.

2.0 Responsibilities

This section outlines the responsibilities of the Site Hygiene Manager (SHM), the Environmental Investigation Site Safety Manager (EISSM), all employers on the site, as well as their Employer's Site Safety Representatives (ESSR) and employees.

2.1 Site Hygiene Manager

The Site Hygiene Manager (SHM), Dr. Bobby Gunter, is responsible for ensuring overall compliance with the provisions of the HASP, except for those that are assigned to the Environmental Investigation Site Safety Manager.

- Monitor compliance with requirements related to chemical and biological hazards contained in Federal Occupational Safety and Health Administration (OSHA) regulations (29 CFR 1910 and 1926) for respiratory protection, personal protective equipment, and exposure to hazardous substances including but not limited to asbestos, heavy metals, PCBs, PAHs, and crystalline silica.
- Ensure compliance with the occupational health requirements set forth in this HASP, working with appropriate parties to ensure that deficiencies are addressed in a timely manner, and updating the requirements of this HASP as necessary to address changing conditions and newly identified hazards in the Building.
- Review collected information pertaining to the chemical and biological hazards present on the site, and summarizing and distributing that information to the environmental investigation personnel as necessary.
- Ensure that all personnel working on the site receive appropriate training in recognition, communication, and control of hazards on the site, and in the requirements of this HASP.
- Ensure that all personnel working on the site maintain up-to-date medical examinations, respirator fit tests, and asbestos training appropriate to their duties.
- Cooperate with the overall Contractor's Site Safety Officer (CSO)¹ and the Environmental Investigation Site Safety Manager to ensure that health and safety issues on the site are identified and appropriately addressed in a timely manner.

2.2 Environmental Investigation Site Safety Manager

The Environmental Investigation Site Safety Manager (EISSM), Matt Zock, is responsible for ensuring compliance, by environmental investigation personnel along with all other personnel as assistance to the SHM, with this HASP, except for those provisions that are assigned to the SHM or CSO.

- Monitor compliance with safety regulations, including OSHA regulations (29 CFR 1910 and 1926), New York City Department of Buildings regulations (pursuant to Local Law 45 of 1983), and the New York City Building Code (Subchapter 19).
- Inspect environmental remediation, including but not limited to asbestos abatement, mold abatement, removal of fungal contaminated materials, etc., performed in the Building to ensure compliance with the

¹ To Be Determined by Laval

requirements for health & safety procedures, and work with appropriate parties to ensure that deficiencies are addressed in a timely manner.

- Identify changing conditions and new hazards in the Building, and submit recommendations for updating this HASP as necessary to address the new conditions.
- Collect and maintain copies of hazard communication programs, material safety data sheets (MSDS), and emergency telephone numbers, from all environmental contractors on site, and distribute that information to all employers on the site as necessary.
- Ensure that all environmental contracting personnel working on the site receive appropriate training in recognition, communication, and controls of physical hazards on the site, and in the requirements of this HASP.
- Perform other duties outlined in this HASP.
- Coordinate with the SHM to ensure that health and safety issues on the site are identified and appropriately addressed in a timely manner.

2.3 Employers

All employers on site are responsible for complying with this HASP as they pertain to the activities and personnel of their company and subcontractors.

- Employers must ensure that their work on site complies with federal, state, and local safety and health regulations, and the requirements of this HASP.
- Provide to the EISSM the information required to be submitted by employers on the site, including copies of hazard communication programs, material safety data sheets (MSDSs), emergency telephone numbers of key personnel, and, where applicable, written Health and Safety Program and, as necessary, written Confined Space Entry Programs and Fall Protection Programs, to be forwarded to the SSM.
- Ensure and document that all personnel working on the site receive appropriate training in recognition, communication and controls of physical, chemical and biological hazards on to which they may be exposed, and in the applicable requirements of the HASP.
- Bring health and safety issues observed on the site to the attention of the CSO, SHM and/or the EISSM and cooperate in mitigating hazards in a timely manner.
- The Employer must designate an Employer's Site Safety Representative (ESSR) to represent the employer in attending meetings and ensuring compliance with this HASP.

2.4 Employer's Site Safety Representative

Each employer must designate an Employer's Site Safety Representative (ESSR) who will be responsible for monitoring the company's compliance with this HASP.

- The ESSR must ensure that their employees and subcontractors comply with applicable OSHA, New York City regulations, and this HASP.
- The ESSR must ensure training of employees and subcontractors in the recognition, avoidance and control of chemical, biological and physical hazards present on site, including multilingual training as necessary to ensure effective communication with all employees and subcontractors.
- The ESSR must maintain records as required by the HASP, and applicable regulations, including medical, fittest, and training records, for all employees and subcontractors.
- The ESSR must alert the CSO, SHM and/or EISSM of conditions that present a health or safety hazard that may not be addressed by this HASP and of site conditions or activities that are not in compliance with this HASP.
- The ESSR must attend Project Safety Meetings as requested and to communicate pertinent information to their employees and subcontractors.

2.5 Employees and Subcontractors

All employees are responsible for performing their work in a healthy and safe manner in accordance with this HASP.

- Obey applicable OSHA and New York City safety and health regulations.
- Familiarize themselves with the physical and chemical hazards on the site and how to protect against these hazards.
- Learn and comply with the requirements of this HASP as they pertain to their work, including personal protective equipment, decontamination, and specific work practices.
- Learn and comply with site security requirements, including entry and exit procedures and inspections.
- Obey prohibitions on drug and alcohol use; smoking in the Building; horseplay; eating, drinking and chewing except in designated areas; and using restrooms except for designated facilities.
- Learn and comply with special requirements for entering restricted areas of the Building.

3.0 Personnel Training

3.1 Personnel Working in the Building

- All employers must ensure that all employees and subcontractors, including specialty trades, possess all licenses, certifications, and training as required by applicable law for the work performed and as required by this HASP.
- All employers must ensure that all employees and subcontractors entering any part of the Building are familiar with the HASP.

3.2 Personnel Working in the Containment Area

- All employers must ensure that all employees and subcontractors entering the containment area have received, at a minimum, within the past year the following general training in a language understood by the employees:
 - A two-hour asbestos awareness-training program.
- All abatement workers must possess valid and current NYSDOL and NYCDEP licenses.
- All employers must ensure that all employees and subcontractors entering the Containment Area have received and documented, within the past six months, site-specific training in a language understood by the employees regarding potential physical, chemical and biological hazards in the building, to include the following topics:
 - Contents and availability of this HASP.
 - Site communication protocols.
 - Identification and control of physical, chemical and biological hazards on site.
 - Selection, use, testing, limitations, and care of respirators to be worn.
 - Decontamination procedures for personnel, personal protective equipment, and other equipment used on the site.
 - Routes of access, egress, evacuation routes, emergency alarm systems, and emergency response procedures and requirements including methods to obtain emergency assistance and medical attention.

4.0 Reduction of Employee Exposures

To protect the health of workers in areas of the Building that have not yet been cleaned, employee exposures will be reduced by the following means.

- Engineering Controls
 - Use fume extractors attached to high-efficiency particulate air (HEPA) filters for all hand-held power tools.
 - Use HEPA-filtered air-filtration devices to reduce dust levels.
 - Use only vacuum cleaners that are equipped with HEPA filters.
- Work Practices
 - Avoid generating dust wherever possible.
 - Wet all dust-laden materials before disturbing them.
 - Handle or remove contaminated materials in a way that minimizes the generation of dust and debris.
 - Thoroughly wash hands, face, hair, and neck upon leaving the area and before eating, drinking, or smoking.
 - No dry sweeping of any materials in the Building.
- Personal Protective Equipment
 - Refer to section 5.0.
 - Decontamination Procedures
 - Refer to section 6.0.
 - Equipment Decontamination and Waste Disposal
 - Refer to section 7.0.

5.0 Personal Protective Equipment

All workers shall wear personal protective equipment (PPE) in areas that have not been abated and met clearance requirements as outlined below (Table 1).

Table 1. Personal Protective Equipment Minimum Requirements

Location	Hazards	Activity	PPE Required
Areas that have not yet been cleaned of visible dust and debris (the containment area)	Asbestos, crystalline silica, heavy metals, PCBs, PNAs, dioxins, in air on surfaces, and in dust, debris and porous materials.	General access, inspection or sampling	<p>Minimum Respirator: 1/2 or full- face APR with P-100.</p> <p>Full Face PAPR during ACM abatement</p> <p>Clothing: Double suit (Tyvek outer suit)</p> <p>Shoes: Hard-soled work boot</p> <p>Gloves: Nitrile</p> <p>Flashlight</p>

5.1 Respiratory Protection

- Only those personnel who have been medically qualified to wear a respirator, and who have been fit tested in the particular respirator (i.e., manufacturer, model and size) they intend to wear, will be allowed to wear a respirator in the Building.
- All employers must provide personnel who may wear a respirator in the Building with personally issued and marked respiratory equipment in accordance with the OSHA asbestos standard (29 CFR 1926.1101) and the OSHA respiratory protection standard (29 CFR 1910.134), including a written respiratory protection program that includes air monitoring, medical monitoring, training and fit testing for employees who wear respirators.
- Respiratory protection must be determined based on Table 1 according to work area and work activity. A respirator of lesser protection may not be used unless sufficient full-shift personal air monitoring has been conducted, representative of “worst case” situations and determined by the SHM to support a downgrade in protection. At no time in the project may disposable dust masks be used for respiratory protection on the site.
- Personnel must ensure that their respirators form a seal against the face so that the wearer receives air only through the air purifying cartridges or hose attached to the respirator. Facial hair that interferes with the effectiveness of a respirator will not be permitted.

- Respirator filters must be changed at the end of each shift. Employers must provide a sufficient inventory of filters for daily replacement.
- Employers are responsible for ensuring the adequacy of respiratory protection (or the lack of respiratory protection) for its employees and subcontractors based on personal air sampling.
- Employers will collect personal air samples of employees according to a Personal Air Sampling Plan, which will be submitted to the SHM for approval. The plan will describe the contaminants to be sampled, the frequency of sample collection, the method of sample collection and analysis, and the method by which employees will be identified for sampling. An employer may rely on specific air monitoring results previously developed by another employer on site if deemed by the SHM to be representative of the employer's employee exposures.
- If at any time personal air samples indicate airborne exposures above one-half of the OSHA Permissible Exposure Limit, or PEL (using the protection factor of the respirator and the OSHA formula for exposure to multiple contaminants), respiratory protection will be upgraded for the activities represented until engineering and work practice controls are demonstrated through additional monitoring of the activity to reduce exposure levels below one-half of the PEL.

5.2 Disposable Protective Clothing

Personnel entering the containment area must wear protective clothing that provides complete skin coverage. This clothing will consist of double suits; inner polypropylene and outer Tyvek.

- Protective clothing that becomes ripped or torn during the workday must be repaired or replaced immediately.
- Except in areas otherwise specified in Table 1, outer protective clothing must be of the nonporous type and/or specifically manufactured for use in asbestos regulated areas (Tyvek or equivalent).
- Disposable protective clothing must be discarded and disposed of as asbestos waste every time the wearer exits from the Containment Area through the decontamination facility.
- Wearing of suits outside the building is prohibited.

6.0 Personnel Entry and Decontamination Procedures

6.1 General Building Access

All personnel entering into the containment area must observe the “buddy system” at all times, maintaining communication or visual contact among crew members at all times.

Personnel new to the Building, the building owner’s employees and representatives and outside consultants, must be escorted by personnel familiar with the Building, the location of the containment area, personnel decontamination units and decontamination procedures, physical hazards, and emergency exit routes.

6.2 Entrance to the Containment Area

- All personnel to enter into a containment area must sign in at the entrance to the containment area. This “sign in” is in addition to the general Building access sign-in.
- All personnel who will enter the containment area must double suit; poly inner and Tyvek outer, Nitrile gloves and their assigned respirator in the change room. Workers must then pass through the equipment room and into the containment area.
- Personnel must not eat, drink, smoke, chew gum, use tobacco or tobacco products or apply cosmetics in the containment area. To do any of the above, the worker must leave the containment area following the complete decontamination sequence.
- In the event that a worker in the containment area requires replacement of a protective suit or respirator filter, he should exit the containment area utilizing proper decontamination procedures, make necessary repairs or replacements, don their respirator and new protective clothing and re-enter the containment area.

6.3 Exiting the Containment Area

- All personnel exiting the containment area must pass through the decontamination enclosure system to decontaminate or dispose of their clothing and equipment.
- Before leaving the containment area, personnel must remove all gross contamination and debris from their disposable coveralls and equipment by vacuuming with HEPA vacuums. Removal of materials from protective clothing or equipment by blowing, shaking, or any other means that may disperse materials into the air is prohibited.
- Personnel will then remove their outer Tyvek and place them in the lined barrels.

- Personnel will then proceed to chamber B and remove their inner suit and gloves and place them in the lined barrels provided.
- Personnel must then proceed immediately into the shower room and wash and rinse hair, neck, face, respirator, arms, and hands.
- Respirators must be removed after the worker has showered to prevent inhalation of fibers. Respirator filters must be disposed of at the end of each workday. Respirator filters, protective clothing and decontamination waste must be disposed as asbestos contaminated waste.
- After showering, personnel must go to the clean room, dress in street clothes, and properly store respirators, and other equipment.

7.0 Equipment Decontamination and Waste Disposal

7.1 Personal Tools and Equipment

Personal tools and equipment that are brought out of the containment area must be decontaminated in the decontamination system as described in Section 6.0.

7.2 Other Tools and Equipment

Other tools and equipment (i.e., from a contractor's central stores or rental equipment) that are brought out of the containment area must be decontaminated in the waste decontamination system per the New York City Asbestos regulations.

8.0 Special Emergency Procedures

- Personnel will be directed to evacuate the Building in the event of a medical or safety emergency, including fire, accident or any other event that increases risks associated with chemical, biological and physical hazards, until the increased risk can be assessed and controlled.
- Site personnel must ensure that their work does not obstruct exits and that work areas are kept neat, clean, and safe.
- Should someone be transported to a hospital or doctor, a copy of this document must accompany them. NECESSARY EMERGENCY PROCEDURES MUST TAKE PRIORITY OVER ALL OTHER REQUIREMENTS OF THIS DOCUMENT.
- The extent of emergency decontamination will depend on the severity of the injury or illness and the nature of the contamination. Decontamination consists of removal of contaminated outer clothing and equipment. If the emergency is such that there is insufficient time or the contaminated clothing cannot be removed, the person should be given required first aid treatment, and then wrapped in plastic or a blanket prior to transportation to medical care. If heat stress is a factor in the

victim's illness/injury, all protective garments must be removed from the victim immediately. Other than the primary exits through the freight elevator and back stairwell to the personal decontamination chamber at the first floor loading dock/elevator lobby, there is an emergency exit through the main stairwell to the loading dock.

- In the event of an illness, injury, or emergency at the site, appropriate emergency measures must be taken immediately to assist those who have been injured or exposed and to protect others from hazards. Call 911 for emergency response.
- In the event of an emergency, the CSO, SHM, and the EISSM must be notified without delay. The CSO, SHM, and EISSM will investigate the site conditions to evaluate and determine the cause of the incident, and the precautions that will be implemented to prevent a reoccurrence.
- In case of a site emergency requiring evacuation of all or part of the Building, personnel must evacuate to a designated safe refuge location, both for their own personal safety and to prevent hampering response/rescue efforts. Each employer will account for all of its personnel.

9.0 Documentation

Establish and maintain documentation that will record, at a minimum, the following information:

- Personnel on the site, their arrival, and departure times at the Building and their destination on the site.
- Information required to be maintained by the OSHA respiratory protection standard, including medical clearance documents, training and certification records, fit-test records, and the results of personal air monitoring to determine employee exposures.
- Incidents and unusual activities that occur on the site, such as, but not limited to, injuries, accidents, spills, breaches of security, equipment failures and weather related problems.
- Records of safety and health inspections by governmental agencies.
- Meeting Minutes of "Tailgate Safety Meetings"

10.0 Standards Incorporated By Reference

The following publications are incorporated by reference.

- Federal OSHA Regulations for General Industry (29 CFR 1920)
- Subpart C (General Safety and Health Concerns)

- Subpart D (Walking and Working Surfaces)
- Subpart E (Means of Egress)
- Subpart G (Occupational Health and Environmental Control)
- Subpart I (Personal Protective Equipment)
- Subpart J (General Environmental Controls)
- Subpart K (Medical and First Aid)
- Subpart L (Fire Protection)
- Subpart P (Hand and Portable Power Tools)
- Subpart S (Electrical)
- Subpart Z (Toxic and Hazardous Substances)
- Federal OSHA Construction Regulations (29 CFR 1926)
- Subpart C (General Safety and Health Provisions)
- Subpart D (Occupational Health and Environmental Control)
- Subpart E (Personal Protective and Lifesaving Equipment)
- Subpart F (Fire Protection and Prevention)
- Subpart G (Signs, Signals, and Barricades)
- Subpart H (Materials Handling, Storage, Use and Disposal)
- Subpart I (Tools-Hand and Power)
- Subpart K (Electrical)
- Subpart L (Scaffolding)
- Subpart T (Demolition)
- Subpart X (Stairways and Ladders)
- U.S. Environmental Protection Agency Regulations
- 40 CFR SUBCHAPTER C
- 40 CFR Part 61, Subpart A (General Provisions)
- 40 CFR Part 61, Subpart M (National Emission Standard for Asbestos)
- US EPA 40 CFR SUBCHAPTER 1
- 40 CFR Part 241, (Guidelines for the Land Disposal of Solid Wastes)

- 40 CFR Part 257, (Criteria for Classification of Solid Waste Disposal Facilities and Practices)
- US EPA 40 CFR SUBCHAPTER R
- 40 CFR Part 763, (Asbestos Hazard Emergency Response Act)
- American National Standards Institute (ANSI) Publications
- Z9.2, (Fundamentals Governing the Design and Operation of Local Exhaust Systems)
- Z88.2, (Practices for Respiratory Protection)
- Underwriters Laboratories, Inc. (UL) Publications
- 586 (Test Performance of High Efficiency, Particulate, Air Filters Units)
- Local Asbestos Licensing Regulations
- The State of New York Department of Natural Resources and Environmental Control asbestos regulations.
- The State of New York Department of Asbestos Licensing Regulation
- City of New York Asbestos Licensing Authority
- National Electric Code (Latest Edition)
- City of New York Department of Licenses and Inspections
- Building Permit and Contractor Licensing Regulations
- American Society for Testing and Materials
- E 1368-99, (Standard Practice for Visual inspection of Asbestos Abatement Projects) National Fire Protection Association (NFPA)
- Standard 701, (Standard Methods of Fire Test for Flame-Resistant Textiles and Films)

11.0 Appendix: Program Contact Information

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6.0 Emergency Action Plan



Emergency Action Plan

**Abatement and Selective Demolition
130 Cedar Street
New York, NY 10006**

October 2006

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**Prepared for:
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56 West 45th Street, 4th Floor
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Emergency Action Plan

1.0 Introduction

This plan explains the steps to be taken in response to an emergency situation for the building located at 130 Cedar Street, New York, NY 10006 ("the Building").

2.0 Reporting Emergencies

All site personnel, upon discovering an emergency situation, shall immediately call 911. The Contractor's Site Safety Officer (CSO) shall be notified immediately thereafter and will assume responsibility as the onsite representative to the First Responders. The CSO shall immediately notify the owner of the Building.

3.0 Building Evacuation

Any explosion, regardless of size or type, any structural failure, fires, and certain power failures require a complete building evacuation.

Designated Assembly Area: In the event of an evacuation, the designated assembly point for site personnel is the southeast corner of the intersection of Washington and Carlisle Streets.

During the safety orientation, all personnel will be instructed to locate and assemble in a manner that will not impede the operations of any business or agency in the area. No visitors or trade personnel shall leave the assembly point until directed by the CSO. Following an evacuation, no one will be allowed to re-enter the Building until cleared by appropriate First Responder, safety, agency or technical personnel investigating the impact of the incident to the Building. The CSO will provide the "all clear" signal to the contractor site managers once it is safe to return to normal work operations.

4.0 Response to Specific Emergency Events

- Below is a list of unplanned events that may occur during the deconstruction project. This list may not be all encompassing, but represents "events" related to similar projects.

4.1 Fire or Explosion

In the event of an explosion or a fire, the CSO shall immediately:

- Call 911.
- Initiate building evacuation procedures as outlined in Section 3.0.
- Meet first responders at the pre-designated assembly area.
- Notify the owner of the Building.

Should there be a work stoppage in a certain area due to a fire or an explosion, work will not resume until the SSO verifies that appropriate corrective actions have been taken.

4.2 Power Failure

In the event of a power failure, the CSO shall immediately:

- Call 911, if warranted.
- Coordinate with the site manager and abatement contractor to initiate containment isolation activities (i.e., both the Personnel and Waste Load Out Decontamination units must be immediately sealed to prevent a fiber release).
- All containment isolation barriers are to remain secure until the required negative pressure has been re-established.

4.3 Structural Failure

The deconstruction process will create weakened sections as supporting elements are removed, (i.e., roof sheathing, wall sheathing). In the event of an unanticipated structural failure, the CSO shall immediately:

- Call 911
- Initiate building evacuation procedures as outlined in Section 3.0
- Coordinate with the site manager and abatement contractor to initiate containment isolation activities (i.e., both the Personnel and Waste Load Out Decontamination units must be immediately sealed to prevent a fiber release).
- All containment isolation barriers are to remain secure until the required negative pressure has been re-established.

Should there be a work stoppage in a certain area due to a structural failure, work will not resume until the Structural Professional Engineer verifies with the appropriate city and/or governmental agencies that appropriate corrective actions have been taken. Structural failure will be examined by the Owner's Professional Engineer for the Project and the New York City Department of Buildings BEST Squad prior to returning to work. The Structural Engineer for the project is John A. Baranello, Jr., Severud Associates Cons. Engineers, 469 7th Avenue, Suite 900, New York, NY 10018. He can be reached at 212-986-3700.

4.4 Worker Injury or Illness

Potential injuries that may result in a medical emergency include:

- Slips, trips, falls, lacerations

- Trauma injuries caused by being struck by heavy equipment, building components, waste containers, etc.
- Eye injuries
- Burns from electrical, fire or explosion
- Electrical contact or electrocution
- Heat stress/stroke
- Chemical exposures
- Cardiac emergencies
- Respiratory emergencies

The Contractor and its subcontractors will respond to minor injuries requiring first aid only; major injuries or requirements for search and rescue will be handled by First Responders.

If a worker is showing signs of distress or obvious injury or illness, the CSO shall be immediately notified and provided the following information:

- Location of victim
- Nature of Emergency
- Whether the victim is conscious
- Specific details regarding the injury or illness
- Whether the victim is in need of decontamination

The CSO will suspend work within the immediate area until the emergency situation has been corrected. If possible the subcontractors' first aid attendant shall treat the injured employee as necessary until a decision is made to seek outside medical assistance or to remove the victim from the Building.

The CSO will be responsible for calling 911 and will inform the First Responders whether asbestos abatement activities are taking place within the Building, and whether or not the injured employee has been brought through the decontamination chamber.

4.5 Unplanned Sudden or Non-Sudden Release of Hazardous Waste or Constituents

It is not anticipated that significant quantities of hazardous waste will be found or stored on the site. If hazardous waste is stored on site, a spill response kit appropriate to the type and quantity of hazardous waste identified will be kept on site. In the event of an unanticipated release, the CSO shall immediately:

- Call 911, if warranted.

- Call NYSDEC Spill Response (800) 457-7362.
- Make a determination whether to implement a building evacuation or control and remediate the release. Procedures for notification to the appropriate regulatory agencies are outlined below.
- Coordinate with the site manager and abatement contractor to initiate containment isolation activities (e.g., sorbents, application of spill response materials).
- Personnel containing the release will be 40-hour HAZWOPER Trained and will have had an 8-hour refresher within the past 12 months.

In accordance with the New York State and New York City Asbestos Rules, if visible emissions occur outside the work area or any air sample within the building but outside the work area indicates a level of fiber concentration at or greater than the 0.01 fibers per cubic centimeter or background levels, work shall stop for inspection and repair of barriers and clean-up of surfaces. Any barriers disturbed will be restored, and clean up of surfaces outside the work area using HEPA vacuums and/or wet-cleaning methods, shall be performed prior to the resumption of abatement activity. Work will not resume until the onsite Environmental Consultant verifies that appropriate corrective actions have been taken. Airborne levels of asbestos fibers outside the work area will be closely monitored to ensure that they are below background /action levels.

In addition, this project will have in place an exterior air sampling program, as presented in the Specification for Community Air Monitoring. Per this plan, the USEPA Region 2 office (any exceedance) and NYCDEP (asbestos exceedance only) will be notified promptly via phone and electronic mail of any exceedance of either a Target Air Quality Level or a USEPA Site Specific Trigger Level and will be notified promptly of any corrective actions taken in connection with the Target Air Quality Level exceedance and the implementation of corrective actions in connection with USEPA Site Specific Trigger Level exceedance.

If exterior ambient air monitoring detects any contaminants of potential concern (COPCs), as identified within the Specification for Community Air Monitoring, above the relevant USEPA Site Specific Trigger Levels, the appropriate actions will be taken. USEPA Region 2 and NYCDEP will be notified regarding the exceedance and the implemented corrective measures, if any, are appropriate.

For any releases of hazardous/regulated wastes to the exterior of the Building, the CSO will call 911. The following agencies will also be notified EPA, NYCDEP, OSHA, NYSDEC, NYSDOH and NYCDOB.

If there is a work stoppage due to an unplanned release of hazardous/regulated waste, work will not resume until the Environmental Consultant's Certified Industrial Hygienist has determined the cause and verified with the appropriate

city and/or governmental agencies that appropriate corrective measures have been taken.

4.6 Falling or Dropped Building Debris

The project may involve hand demolition of building masonry facade. In the event of unanticipated dropping of debris, the CSO shall immediately:

- Call 911, if warranted.
- Stop work and identify source of dropped debris.
- Coordinate with the site manager and demolition contractor to review work practices and site protection.
- The Site Manager will contact NYC Department of Buildings, if warranted.

No work is to re-commence until work practices and site protection have been adjusted to prevent a recurrence. If any structural deficiency is noted, the Structural Engineer for the project, and the New York City Department of Buildings, if warranted, will be called to inspect and approve remedial actions.

7.0 Waste Sampling and Management Plan



Waste Sampling and Management Plan

**Abatement and Selective Demolition
130 Cedar Street
New York, NY 10006**

October 2006

Prepared by:
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**Prepared for:
Masterworks Development Corporation
56 West 45th Street, 4th Floor
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Waste Sampling and Management Plan

1.0 Introduction

The objective of the Waste Sampling and Management Plan is to characterize, manage, containerize, and legally transport and dispose of waste streams that will be generated as part of the abatement and selective demolition of the building located at 130 Cedar Street, New York, NY 10006 ("the Building").

1.1 Abatement Phase

The abatement phase includes the cleaning and/or removal of all accessible contaminated interior surfaces and non-structural elements within the Building under containment. The abatement phase will occur under negative pressure containment and includes the following general categories: (a) the general area cleanup of WTC dust and debris; (b) removal and disposal of installed porous and certain non-porous building materials and components; (c) cleaning and salvage of certain installed non-porous building equipment and components; (d) removal of building materials containing asbestos which were present in the Building prior to September 11th, 2001; (e) packaging of asbestos and other regulated waste including, but not limited to light bulbs, lighting ballasts, batteries, mercury containing thermostats, etc. at generation points; (f) movement of containers to the decontamination unit and movement of decontaminated containers to waste loading.

1.2 Selective Demolition Phase

The selective demolition phase includes the deconstruction of the remaining cleaned interior and exterior walls and other non-structural elements.

1.3 Waste Determinations

The Environmental Consultant will characterize the waste streams as they are generated. Based on the results of this characterization, and any analytical results received, the Environmental Consultant will issue an addendum, if necessary. The Contractor or its authorized representative will ensure proper handling and disposal activities as described in this plan.

2.0 Building Components

The waste sampling and management plan has been developed to address the removal of all building contents and components, including waste generated during the abatement phase (i.e., asbestos and contaminants of potential concern removal abatement, and soft strip/interior gut) and the selective demolition phase (non-structural building elements). Anticipated waste streams are listed below.

2.1 Contaminants

- Asbestos Containing Building Material (ACBM)
- Lead Based Paint
- WTC Contaminated Porous Materials

2.2 Deconstruction Waste

- Wall and Ceiling Plaster (TCLP of 5ppm Lead)
- Door Systems and Window Systems
- Wall masonry and tile
- Mechanical Electrical Plumbing (MEP) components including, but not limited to, heating, ventilation and air conditioning (HVAC) systems, plumbing, wiring, refrigeration equipment and kitchen components.

2.3 Miscellaneous Materials

Due to the small scale of the Building and its systems, additional regulated and/or hazardous waste is anticipated to be very limited in nature and scope. Regardless, the Waste Sampling and Management Plan addresses the potential for regulated waste in the following categories:

- Light ballasts and potting material
- Refrigerants
- Fire extinguishers
- Occupants' items
- Accumulated waste

2.4 Structure & Exterior/Interior Walls

At completion of the abatement phase, the majority of the interior and exterior walls of the Building will remain. The interior materials will have been pressure washed and spray-encapsulated as needed, and the exteriors will have been pressure washed.

The classification of building components and contents will be an ongoing effort and will be conducted by the Environmental Consultant in accordance with applicable New York City, New York State and federal laws, rules, and regulations.

3.0 Waste Characterization Strategy

Waste generated during the project will be characterized, managed, transported and disposed of in compliance with this Waste Sampling and Management Plan and applicable regulations.

For materials requiring sampling, a representative sampling strategy will be used as detailed in Section 4.0, and composite samples representative of the final waste streams will be collected. The locations and frequency of samples to be combined into composite samples shall be determined by the Environmental Consultant such that a representative sample of the waste type has been obtained. All sampling personnel shall be familiar with sample collection and waste storage protocols and shall have undergone Hazard Communication training in accordance with 29 CFR section 1910.1200 as well as being trained appropriately per the Health and Safety Plan.

The waste classification samples will be sent to a New York State Environmental Laboratory Approval Program (ELAP) certified (6 NYCRR Section 370.1(f)) and qualified laboratory for waste classification analysis (e.g., TCLP and RCRA characteristics) to determine appropriate waste classification and handling requirements (40 CFR section 262.11). Other sampling and laboratory analysis may be required by the disposal facility prior to waste acceptance. The laboratory subcontracted to perform the analysis will also be certified through the National Environmental Laboratory Accreditation Program (NELAP) for the analytical parameters being analyzed, so there is assurance that the laboratory has passed a nationally recognized quality assurance program that includes audits, analysis of blind performance samples to check data quality and meeting certain minimum technical standards for the qualifications of testing personnel.

Upon receipt of analytical results, determination of waste classification and identification of disposal facilities, the Environmental Consultant will identify applicable regulatory requirements for waste handling, worker training and protection (e.g., specific training/certifications, personal protection equipment), packaging (e.g., type of packaging, marking, labeling), transporting (e.g., placarding, shipping papers), waste routing and disposing of these wastes. Since waste classification samples will be collected from in-place materials, on-site storage of structure and facade wastes for waste classification will not be required. Rather, all removed materials will be placed into their applicable disposal containers/vehicles for off-site shipment. All potentially hazardous waste will be managed as hazardous waste until analytical laboratory results are received. If the structural and/or wall components test as hazardous waste, they will be handled and disposed of as hazardous waste as a part of the abatement phase.

If greater than 100 kg/month of hazardous waste is generated during the deconstruction process, Contractor will comply with, among other regulations, 6 NYCRR Part 373, Subpart 373-3, Section 373-3.3(b).

If results of waste characterization sampling and analysis dictate that waste material must be managed and disposed of as both asbestos and hazardous waste, both asbestos and hazardous waste management and disposal requirements will be met.

3.1 Contaminants

Full-building visual surveys have been conducted, and in-place ACBM has been identified and located. No further characterization will be conducted unless site conditions reveal additional suspect materials not addressed in the ACBM surveys. WTC dust is assumed to exist at the site.

3.2 Deconstruction Waste

Deconstruction waste sampled and analyzed for RCRA characteristics will include:

- Wall and Ceiling Plaster
- Any building components/materials not currently identified as part of the initial confirmatory sampling event will be sampled during the abatement phase of the project as necessary.

3.3 Miscellaneous Materials

Due to the small scale of the Building and its systems, additional regulated and/or hazardous waste is anticipated to be very limited in nature and scope. Regardless, the Waste Sampling and Management Plan addresses the potential for regulated waste in the following categories:

- Light ballasts and potting material
- Refrigerants
- Fire extinguishers
- Occupants' items
- Accumulated waste

The Environmental Consultant will conduct daily inspections of the abatement work area to identify suspect components for segregation and testing and/or other determination.

Any material classified as "unknown" during the project will require sample collection and analysis for full RCRA characteristics in accordance with 40 CFR Part 261 and will be disposed of based upon the results of that sampling and the nature of the waste. If the material is classified as RCRA hazardous waste, additional sampling may be required for "total" concentrations of specific contaminants to determine whether the waste may be land filled or is restricted from land disposal pursuant to 40 C.F.R. Part 268; the analyses to be conducted will depend on the specific waste classification of the waste.

Used PPE and spent filters will be packaged, handled and disposed of as ACM waste.

If additional categories of waste are observed during the work that are suspected to have different waste characteristics than those sampled, these materials will be

sampled for waste characterization prior to removal. Materials similar in composition and WTC impact to those sampled would then not be sampled for Resource Conservation and Recovery Act (RCRA) characteristics unless there is an independent concern that they might be hazardous waste due to the inherent composition of the component, subcomponent or waste stream (e.g., light ballasts which may contain PCBs, items coated with lead-based paint).

Porous deconstruction waste will be disposed of according to the results of waste characterization sampling, if necessary, and as ACM at a minimum.

Non-Porous Deconstruction Waste may be managed by either of two options. The abatement Subcontractor may choose to clean the nonporous surfaces in accordance with procedures outlined in the Specification for Abatement and Selective Demolition.

The resulting cleaned material will not be sampled unless it is painted; in that instance, sampling will be performed as described in Section 6.0. Alternatively, based on field conditions and decisions regarding the use of its labor force, the Abatement Subcontractor may choose to not clean the surfaces and instead manage those un-cleaned non-porous materials as asbestos waste at a minimum or otherwise, if required, as determined by the RCRA characteristics sampling.

Porous and non-porous miscellaneous materials will be handled, packaged and disposed in the same manner as demolition wastes as described in Section 3.2.

Those miscellaneous materials specified in Section 2.3 that were not sampled as part of the initial confirmatory sampling event will be sampled as specified in Sections 5.2 and 5.3 during the abatement phase of the project.

3.4 Structure & Exterior/Interior Walls

At completion of the abatement phase the majority of the interior and exterior walls of the building will remain. The interior materials will have been pressure washed and spray-encapsulated as needed, and the exteriors will have been pressure washed.

4.0 Analytical Methodologies

If testing is deemed necessary, waste characterization will be performed according to the following methodologies. Where more than one method is identified, each analytical method is valid per the regulations. All allowable methods are included in this plan to allow for flexibility in selecting an analytical laboratory or laboratories.

4.1 Ignitability

The characteristic of ignitability carries the RCRA waste code of D001, and may be analyzed for using American Society of Testing Materials (ASTM) method D-93-79 or D-93-80 or D-3278-78.

4.2 Corrosivity

The characteristic of corrosivity carries the RCRA waste code of D002, and may be analyzed using Method 9045D or 9040C as set forth in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846. SW-846 method 9040 C is for aqueous wastes and multiphase waste where the aqueous phase constitutes at least 20% of the total volume of the waste; 9045D is for soils and waste samples where the waste may be solids, sludges, or nonaqueous liquids. The aqueous phase must be less than 20% of the total volume of the waste. National Association of Corrosion Engineers (NACE) Standard TM-01-69 as standardized in SW-846 shall be utilized to evaluate corrosion rate if the suspected corrosive hazardous waste is a liquid.

4.3 Reactivity

The characteristic of reactivity carries the RCRA waste code of D003, and may be analyzed using the analytical methods outlined in sections 7.3.3.2 or 7.3.4.2 of "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846. The referenced sections are from SW-846 Chapter Seven: Characteristics Introduction and Regulatory Definitions. They are specifically for Reactivity. Chapter Seven was revised to reflect the withdrawal of the reactive cyanide and sulfide guidance in sections 7.3.3 ("Interim Guidance for Reactive Cyanide") and 7.3.4 ("Interim Guidance for Reactive Sulfide"), and to replace certain characteristic explanatory text with referrals to the regulations themselves. This change can be found in the Proposed Update IIIB to SW-846.

4.4 Toxicity

The characteristics of toxicity carry the RCRA waste codes of D004 through D043. Each waste code identifies the specific chemical component for which the waste is classified as toxic. The samples to be analyzed for the characteristic of toxicity must be prepared using the Toxicity Characteristic Leaching Procedures (TCLP) per Method 1311 in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846. The analytical method applied to the resulting leachate depends on the type of chemical being analyzed for, as follows:

- Volatile organic compound (VOC) toxic constituents will be analyzed by Method 8260B of "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846. VOC toxic constituents include benzene (D018), carbon tetrachloride (D019), chlorobenzene (D021), chloroform (D022), 1,4-dichlorobenzene (D027), 1,2-dichloroethane (D028), 1,1-dichloroethylene (D029), methyl ethyl ketone (D035), tetrachloroethylene (D039), trichloroethylene (D040), and vinyl chloride (D043).
- Semivolatile organic compound (SVOC) toxic constituents will be analyzed by Method 8270C of "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846. SVOC toxic

constituents include 2,4-dinitrotoluene (D030), hexachlorobenzene (D032), hexachlorobutadiene (D033), hexachloroethane (D034), o-cresol (D023), m-cresol (D024), p-cresol (D025), cresol (D026), nitrobenzene (D036), pentachlorophenol (D037), pyridine (D038), 2,4,5-trichlorophenol (D041), and 2,4,6-trichlorophenol (D042).

- Pesticide toxic constituents will be analyzed by Method 8081A of "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846. Pesticide toxic constituents include chlordane (D020), endrin (D012), heptachlor and its epoxide (D031), lindane (D013), methoxychlor (D014), and toxaphene (D015).
- Herbicide toxic constituents will be analyzed by Method 8151A of "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846. Herbicide toxic constituents include 2,4-D (D016) and 2,4,5-TP (also known as Silvex, D017).
- Mercury (D009) will be analyzed by Method 7470A (aqueous samples) of "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846.
- Metals/inorganics other than mercury will be analyzed by Method 6010B, or Method 6020 of "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846. These constituents include arsenic (D004), barium (D005), cadmium (D006), chromium (D007), lead (D008), selenium (D010), and silver (D011).

Generally, building components would not be considered as possible RCRA characteristic wastes except for the potential that exists due to impacts by WTC dust. The notable exceptions to this would be painted surfaces (which would typically be sampled for TCLP RCRA Metals), as well as miscellaneous materials containing hazardous components (i.e., transformers, ballasts, lamps) prior to the WTC event.

The results of RCRA characteristic analyses, the classification of the material based on historical information, as well as the material's status as presumptively asbestos-contaminated, will be used as the basis for the Waste Profile for the particular waste stream.

5.0 Sampling Frequencies and Disposal

5.1 Contaminants

The limited ACBMs at the site have been identified and located. Limited WTC dust sampling has been conducted. Further WTC dust will be identified, and further sampling will be conducted to support waste classification prior to removals off-site. Representative samples of dust will be collected and composited for analysis. These results will be available prior to the commencement of site work. Disposal

will be according to the waste characterization sampling, and as ACM at a minimum.

5.2 Deconstruction Waste

For each of the deconstruction waste materials listed in Section 2.2, a minimum of five confirmatory waste samples will be collected from different locations and functional spaces in the Building. The samples will be composited for analysis (one analysis per material). Preliminary sampling has been conducted.

Deconstruction waste materials not sampled as part of the initial confirmatory sampling event, and those building components that the regulators deem need to be re-sampled, if necessary, based on its review of the confirmatory sampling analytical results, will be sampled as specified in Section 4.2 during the abatement phase of the project. Results will be available prior to the commencement of site removals. Disposal will be according to the waste characterization sampling and as ACM at a minimum.

5.3 Miscellaneous Materials

Due to the small scale, and simple use of the building and its systems, additional miscellaneous regulated and/or hazardous waste is anticipated to be very limited in nature and scope. The Environmental Consultant will conduct daily inspections of the abatement work area to identify suspect components for segregation and testing and/or other determination. The Environmental Consultant will make determinations as to the appropriate testing required to characterize any materials encountered. Where possible, each floor of each building will be represented within any composite sample of miscellaneous waste, and the minimum of five grab samples to be composited will be observed.

5.3.1 Light Ballasts and other PCB Wastes:

During deconstruction activities, as ballasts are removed from lighting fixtures, the Abatement Subcontractor shall clean the surfaces of dust and containerize ballasts for disposal as PCB waste. All ballasts, including those labeled "No PCB" will be containerized for disposal as PCB waste due to the presence of potting material. For potentially PCB-containing equipment other than ballasts, PCB samples may be required to determine whether the dielectric fluid contains more than 50 parts per million (ppm) PCBs, which would make the equipment subject to the PCB regulations. SW-846 Method 8082, Analysis of Polychlorinated Biphenyls by Gas Chromatography is specified by regulation for determining the concentration of PCBs in wastes.

Ballasts (all assumed to contain PCBs) shall be handled, packaged and labeled as required for disposal as a PCB regulated waste. All hauler, transportation and disposal facility requirements shall also conform to the requirements for this category of waste.

Shipments of PCB waste must be in properly labeled and marked containers, the waste must be shipped under a properly executed manifest and Land Disposal Restriction (LDR) form, the transporter must have a valid EPA Identification number and must have a valid New York State Part 364 transporter permit as well as the latest version of U.S. Department of Transportation's Emergency Response Guide (2004). The vehicle in which PCB wastes are being shipped must be properly placarded and marked to reflect that it is transporting PCBs and must also be marked with the New York State waste transporter permit number on its sides and rear.

Disposal facilities that accept PCB wastes must have an EPA Identification number and have received TSCA authorization from the EPA and any additional state permits for the disposal/management of PCBs applicable to the state in which the facility is located. The disposal facility must comply with all manifesting requirements specified in the regulations and must prepare a certificate of destruction and send it to the generator or the generator's agent.

5.3.2 Universal Waste

Only minor quantities of materials that could be categorized as Universal Waste are anticipated to be encountered at this site. For those materials encountered, the Abatement Subcontractor shall clean the surfaces of dust. In the event that such materials are encountered, they are addressed by this WMP.

40 CFR Part 273 and 6 NYCRR Section 374.3 establish requirements for managing universal wastes. Universal wastes are those wastes that would reasonably be expected to be classified as hazardous wastes but, due to their universal use in industrial and residential properties, regulations were created that would ensure that they were managed in a manner that prevented harm to the environment while reducing the regulatory burden on generators of these wastes. Universal wastes include the following waste types:

- Batteries as described in 40 CFR section 273.2 and 6 NYCRR Section 374-3.1(b)
- Pesticides as described in 40 CFR section 273.3 and 6 NYCRR Section 374-3.1(c)
- Thermostats as described in 40 CFR section 273.4 and 6 NYCRR Section 374-3.1(d)
- Lamps as described in 40 CFR section 273.5 and 6 NYCRR Section 374-3.1(e)
- Refrigerant-containing Equipment

Given that such wastes will be minor in quantity at this site, these wastes, if encountered, will be managed according to hazardous waste regulations.

Non-hazardous construction and demolition materials may contain regulated refrigerant including, but not limited to, possible refrigerant in the air conditioning and refrigeration systems. The refrigerant will be removed prior to disposal. Refrigerant-containing equipment would be considered an appliance and is excluded from definition of C&D debris. For refrigerant-containing equipment the following procedures shall be followed:

- Verify refrigerant has been removed. If not, a licensed refrigerant removal service must be called to properly dispose of refrigerant.
- Equipment that contains refrigerant will be HEPA vacuumed and wet-wiped before being staged in a clearly demarcated on-site area until the refrigerant has been removed by a licensed refrigerant removal service.
- Remove door on refrigerators and freezers.
- After removal of refrigerant and otherwise rendering the appliance safe, recycle or dispose of the appliances as scrap metal or as municipal solid waste, respectively.

5.3.3 Accumulated Waste

The building currently contains miscellaneous accumulated waste, primarily associated with previous abatement work and pre-event lessees. These materials will be inspected, categorized (i.e., cleaning supplies, lubricants) and sampled for RCRA characteristics. These materials will be disposed of according to the results of the waste characterization sampling and as asbestos-containing wastes at a minimum. Further sampling, if deemed appropriate by EPA will be conducted immediately.

5.3.4 Fire Extinguishers

In the case of both charged and discharged fire extinguishers, the manufacturer of the fire extinguisher will be contacted for the proper discharge and disposal method. Alternately, local fire department(s) may be contacted to determine if they would like to acquire the charged fire extinguishers in volunteer or community training exercises. If the above approaches prove impractical, fire extinguishers shall be depressurized in accordance with manufacture's recommendations and all regulatory requirements. Contained media shall be collect upon depressurization, characterized, and recycled or disposed, if and as required. Empty extinguisher bodies shall be rendered inoperable by cutting in half or puncturing, then recycling as scrap metal or disposing as municipal solid waste. If fire extinguishers are found, the Environmental Consultant will make a determination.

5.3.5 PPE/Filters

PPE/Filters will be disposed of as asbestos contaminated waste.

5.4 Structure & Exterior/Interior Walls

If necessary, sampling of the structure and wall materials will be conducted to confirm the waste status of the structure and the walls prior to commencement of the selective demolition phase. For each of the structural and wall material categories noted at the site, five confirmatory waste samples will be collected and composited for analysis. Samples will be collected from various locations and functional spaces within each building. Results will be available prior to the commencement of the selective demolition phase. Disposal will be according to the waste characterization sampling.

6.0 Non-Porous (Cleanable) Waste

For cleaned (wet-wiped/HEPA-vacuumed) non-porous deconstruction waste, TCLP Metals samples will not be collected unless the non-porous components are painted and to be disposed of (i.e., not recycled). Cleaned painted scrap metals that are recycled are exempt from the below described waste characterization sampling and analysis. For non-porous components that are painted, one composite sample made up of a minimum of four grab samples of each distinct painted non-porous building component (based on paint color, building component type and zone in which the component is located) will be collected for TCLP RCRA metals analysis. Each grab sample will be collected as a core sample (i.e., both painted surface and building component matrix) and sent to the laboratory for analysis with a Chain-of-Custody.

Likewise, cleaned, painted, non-porous deconstruction waste with TCLP RCRA metals results of less than applicable standards would also be classified, managed and recycled/disposed of as non-hazardous construction and demolition (C&D) debris.

Cleaned, painted, non-porous deconstruction waste with TCLP RCRA metals results greater than applicable standards would be classified, managed and disposed of as hazardous waste with the toxicity characteristic of the exceeded RCRA Characteristic.

Cleaned, unpainted, non-porous deconstruction waste will be visually inspected by the Environmental Consultant, and may be recycled and/or disposed as C&D waste if TCLP metals analyses of surface dust wipes are less than the applicable standards. Materials that exceed the applicable standards will be packaged, handled and disposed in accordance with the regulation applicable to their category of waste. The Environmental Consultant will make determinations on representativity of waste sampling based on the quantity and nature of such wastes encountered.

Non-cleaned, non-porous deconstruction waste will be disposed of as asbestos waste at a minimum for the reasons indicated previously. Should results of the settled dust classification sampling indicate that the dust results exceed the regulatory threshold for one or more RCRA characteristics, non-cleaned, non-porous items originating from areas where dust exceeded the threshold would be

categorized and handled according to those results. If the dust characterization was not conclusive at the original location in the building of this class of material the item(s) would be subject to bulk or core or wipe sampling for RCRA characteristics prior to disposal. If a significant number of these items originate from the same functional area of the building and further testing was deemed appropriate based on the dust characterization testing, bulk or core or wipe sampling on at least 10% of the items, but not less than five items, would be conducted. If bulk or core or wipe sample results indicate that the materials exceed the regulatory threshold for one or more RCRA characteristics, the waste will be managed as both a RCRA waste of the appropriate waste code as well as asbestos waste.

7.0 Waste Packaging & Storage

Locked waste storage areas will be established in the Building near the exit/decontamination units to accommodate both categorized waste awaiting transport and suspect waste awaiting analyses. Storage areas will be plasticized, and any liquid storage will have secondary containment. Incompatible waste streams will be segregated, and waste labeling and signage will be in strict accordance with regulations. Within the storage area, posted signs, labeled accumulation start dates, labeled description of the waste, aisle space, proper segregation of incompatible and or/ignitable waste, etc. will be inspected on a daily basis by the Environmental Consultant.

All containers at the Building will have proper labeling, which includes information such as waste type and accumulation date.

7.1 Hazardous Waste

Hazardous waste will be placed in containers made of or lined with materials which will not react with, and are otherwise compatible with, the hazardous waste to be stored so that the ability of the container to contain the waste is not impaired (e.g., USDOT approved drums, bags, roll-off containers) and transferred to the waste storage area pending transport. While being accumulated on-site, each container shall be labeled or marked clearly with the words, "Hazardous Waste". Containers will be inspected at least weekly to identify any leaks, and/or deterioration caused by erosion or other factors, and to ensure containers are not over-packed. Hazardous waste will not be placed in an unwashed container that previously held an incompatible waste. Any disposal container holding a hazardous waste that is incompatible with any waste or other materials contained nearby will be separated from the other materials or protected from them by means of a dike, berm, wall, or other device.

7.2 Universal Waste

Universal waste will be handled, packaged, and stored pending transport according to all regulations governing universal wastes. Refer to Section 7.1.

7.3 Asbestos Waste

Waste containing asbestos will be wet down to prevent visible emissions of asbestos dust into the air. The asbestos waste will be sealed while wet in a leaktight container. A supply of leak tight containers will be kept in the waste storage area to provide adequate repackaging if a break in the container should occur. Storage area shall be maintained under a negative pressure ventilation system. ACM packaging and waste decontamination procedures will be in accordance with Title 15 Chapter 1 of the Rules of the City of New York. Daily inspections of the waste storage area shall be required.

Storage of asbestos waste will not exceed 50 cubic yards. Authorization from the New York City Department of Sanitation (NYCDOS) and additional requirements, per code, will be required if accumulation of asbestos is anticipated to be greater than 50 cubic yards. Containers holding asbestos waste will be inspected daily to ensure no visible emissions of asbestos dust in the air or breaks in the container.

7.4 Exterior Wash Water

Wash water collected per the Specification for Abatement and Selective Demolition shall be pumped to new, clean 55-gallon drums. Aliquots from each drum of wash water will be collected. Each composite sample will be analyzed for RCRA characteristics and will be tested as required to comply with NYC DEP Title 15 Chapter 19 (Use of the Public Sewer) Subchapter 19-04. If the water is not regulated under RCRA, and if it meets NYC DEP discharge criteria, it will be filtered through a 5 micron filter prior to disposal to the NYC sewer system per NYC Title 15, Part 1-82 (b) 1. If testing indicates the water is regulated under RCRA, it will be handled, packaged and disposed of in strict accordance with its categorization. Until its determination as hazardous waste, it will be stored in the ACM waste decontamination unit as permitted by NYC DEP Title 15. All filtration media and PPE associated with this operation will be handled as ACM waste at a minimum pending HazWaste determination.

7.5 PCB Waste

Non-leaking PCB waste (i.e., PCB bulk product waste, including fluorescent light ballasts) will be packaged in suitable containers, properly labeled and stored for transport in the Waste Storage Area. Any leaking PCB articles or containers will be transferred to properly marked, non-leaking containers or an over-pack container, and likewise labeled and stored for transport.

8.0 Transportation Requirements

All waste materials will be transported in accordance with applicable local, state and federal DOT regulations including, but not limited to, bills of lading, manifests, placards, etc. All wastes will be shipped using properly permitted vehicles operated by drivers with Commercial Drivers Licenses (CDLs) and Hazardous Materials endorsements. All hazardous waste will be shipped using transporters with RCRA identification numbers. The actual modes of transportation to be

utilized will be determined following the identification of all anticipated waste streams and will take into account the location and distance to the selected disposal facility as well as cost considerations. All off-site shipments of waste will adhere to the site-specific transportation requirements. As required by NYSDEC (6 NYCRR Part 364) all hazardous and asbestos wastes will be transported using Part 364 permitted haulers.

9.0 Travel Routes

Travel route(s) will be determined following discussion with the appropriate regulatory agencies (e.g., New York City Department of Transportation), and the Lower Manhattan Construction Command Center (LMCCC). The selected waste transporter(s) will follow the designated travel routes.

10.0 Disposal Facilities

Waste recycling/disposal facilities will be selected based on several factors including waste types, facility acceptance criteria, regulatory compliance history. Potential facilities to be used include:

- Asbestos

Meadowfill Landfill

Route 2, Box 68, Bridgeport, WV 26330

Permit # SWF-1032/WV0109193

- Lead - Recyclable

RCRA Exceedance: Republic Environmental Systems

2269 Sandstone Dr., Hatfield, PA 19440

EPA ID 085690592

- Tanks

Republic Environmental Systems

2269 Sandstone Dr., Hatfield, PA 19440

EPA ID 085690592

Only those facilities that have valid federal/state/local permits to accept the waste type proposed for recycling/disposal at the facility will be used.

11.0 Documentation

All applicable local, state and federal documentation and record keeping requirements/guidelines will be followed. Documentation for hazardous waste disposal includes hazardous waste determination documentation including all analytical results, Hazardous Waste Manifesting, EPA Generator ID, EPA transporter ID, EPA ID for waste disposal facility and waste storage locations and capacities. Also documented will be emergency notification and operating

procedures, organizational chart, unexpected waste procedures, contractor involvement list and copies of the regulatory requirement certifications of transporters, disposal facilities, etc. Specific regulatory documentation may change depending on the types and amounts of waste to be generated. The Contractor shall be responsible for document management. All documentation noted under this section shall be retained for a period of not less than three years after the completion of the project.

8.0 Quality Assurance Program Plan



Quality Assurance Program Plan

**Abatement and Selective Demolition
130 Cedar Street
New York, NY 10006**

October 2006

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Quality Assurance Program Plan

Plan Approval

The following individuals have reviewed and concur with this Quality Assurance Program Plan (QAPP) for the building located at 130 Cedar Street, New York, NY 10006 ("the Building") as indicated by their signature.

Mr. David Crawford, Project Director¹

Dr. Charles Kraisinger, Quality Assurance Officer¹

Mr. Mike Campbell, Senior Project Manager¹

Mr. David Sundell, Site Supervisor¹

Mr. Mathew Zock, Environmental Investigation Site Safety Manager and
Community Air Monitoring Coordinator¹

¹ Denotes Employee of RJ LeeGroup, Inc.

1.0 Project Responsibilities

1.1 Project Directors

Project directors have overall responsibility for the design and conduct of this project. They will be the principal data users and decision makers. The project director's duties include:

- Assigning duties to the project staff and familiarizing the staff with the needs and requirements of the project as they relate to the project objectives
- Preparing site-specific schedule
- Reviewing all major project deliverables for completeness
- Closing out the project
- Maintaining the project files

1.2 Project Managers

Responsibility for implementation of the tasks specified in this project plan have been assigned to the project environmental consultants who may personally assess any aspect of this plan and require response actions as needed, or may delegate assessment responsibility to qualified staff. Project Managers have overall responsibility for ensuring successful performance of the tasks specified in this plan.

1.3 Laboratory Project Managers

Each laboratory project manager will report directly to an RJLG project manager or his designee. The laboratory project manager's duties include:

- Ensuring all resources of the laboratory are available as required
- Coordinating laboratory analyses
- Supervising in-house chain-of-custody
- Scheduling sample analyses
- Overseeing data review
- Overseeing preparation of analytical reports
- Overseeing production and final review of analytical reports
- Approving final analytical reports prior to release

1.4 Quality Assurance Officer

The Quality Assurance Officer is responsible for data after it leaves the laboratory.

- Oversee laboratory QA and site QA
- Oversee QA/QC documentation
- Conduct detailed data review or designate a reviewer.
- Determine whether to implement laboratory corrective actions, if required
- Define appropriate laboratory QA procedures

1.5 Laboratory Sample Custodian

A laboratory sample custodian will report to the laboratory manager. Responsibilities of the laboratory sample custodian may include:

- Receiving and inspecting the incoming sample containers
- Recording the condition of the incoming sample containers
- Signing appropriate documents
- Verifying COC (chain of custody)
- Notifying laboratory manager of sample receipt and inspection
- Assigning a unique identification number and customer number to all samples, and entering each in to the sample receiving log
- Initiate transfer of the samples to appropriate laboratory sections

1.6 Laboratory Technical Staff

The laboratory technical staff will be responsible for sample analysis and identification of corrective actions. The staff will report directly to the laboratory managers.

1.7 Site Supervisors

The site supervisors will support the off-site project managers. The supervisor is responsible for leading and coordinating the day-to-day activities of the various resource specialists under his supervision. The supervisor is a highly experienced environmental professional and will report directly to the project manager or his designee. Specific supervisor responsibilities may include:

- Coordinating field related activities with the project manager

- Developing and implementing field related work plans, assurance of schedule compliance, and adherence to the Community Air Monitoring Plan
- Coordinating and managing field staff
- Implementing QC for technical data provided by the field staff including field measurement data
- Adhering to work schedules provided by the project manager
- Coordinating and overseeing the air monitoring program for the site
- Identifying problems at the field level, resolving difficulties in consultation with the RJLG project director, Mr. David Crawford then implementing and documenting corrective action procedures, and provision of communication between team and upper management
- Participating in preparation of the final report

1.8 Field Technical Staff

The field technical staff for this project will be drawn from RJLG's pools of corporate resources. The technical staff will be utilized to gather and analyze data and to prepare various task reports and support materials. All of the designated technical team members are experienced professionals who possess the degree of specialization and technical competence required to effectively and efficiently perform the required work.

2.0 Data Quality Objectives and Criteria for Measurement

The data quality objectives and criteria for measurement is designed to ensure that sampling and analyses are carefully thought out and that the results of the effort will be adequate to meet the basic objectives of the air monitoring program. Additional indoor or ambient air data generated by site contractors and others may be collected and incorporated into the air monitoring program reports as the data become available or are required.

2.1 Background

The primary issue to be addressed is a potential for emissions from the site in excess of COPC air criteria standards in the Specification for Community Air Monitoring to cross the property boundary or emerge from the Building as a result of an engineering or administrative control breakdown.

The secondary issue addressed is to provide a record of air monitoring and any associated responses for future reference.

2.2 Identify the Decision

The decisions to be made on a daily basis are:

- Are engineering controls maintaining air quality at the property boundary within the site standards as set forth in the Specification for Community Air Monitoring?
- If not, what engineering controls are required?

2.3 Identify Inputs to the Decision

Data needed to achieve the decision objective includes accurate and reliable measurements of real-time and time-weighted analysis for air monitoring and samples collected as provided in the Specification for Community Air Monitoring. During the abatement phase, perimeter air monitoring data of the site may be compared to air results collected inside containment by the Abatement contractor.

The primary data used for decision making will be real-time and laboratory data generated from samples collected at the Site. Additional samples and analysis may occur as required to support decision making.

Inputs to the decision model include established air quality levels for the site contained in the *World Trade Center Indoor Air Assessment: Selecting Contaminants of Potential Concern and Setting Health-Based Benchmarks*, prepared by the Contaminants of Potential Concern (COPC) Committee of the World Trade Center Indoor Air Taskforce Working Group and site background levels. Whichever value is more stringent will be used to determine an exceedance. Established air quality levels are summarized in Table 1. The community action levels are derived assuming a potential one-year exposure to members of the community during the abatement phase and selective demolition phase of the Building. Exposures are assumed for 24-hours per day, 365 days per year. An additional consideration was that air monitoring of ambient air will be conducted at the building perimeter and, therefore, will overestimate actual community exposures. Therefore, application of action levels based on assumed continuous exposure to members of the community to facility perimeter sampling will add an additional inherent "safety factor" to the monitoring program. The following criteria were used for derivation of these action levels.

2.4 Evaluation of Monitoring Results

With the exception of the 24-hour NAAQS for PM_{2.5} and PM₁₀, the Community Air Monitoring Action Levels described herein are based on average exposures during the building Abatement Phase and Selective Demolition Phase. Therefore, the following criteria will be used to evaluate the monitoring data collected during pursuant to this program:

1. Any 24-hour PM_{2.5} and PM₁₀ value in excess of the 24-hour NAAQS will be considered an "exceedance" and the actions described below will be taken.

2. Any 24-hour sample of analytes other than PM_{2.5} and PM₁₀ in excess of 3 times the action level will be considered an exceedance and the actions described below will be taken.
3. Following the first week of sampling, a “rolling average” will be established based initially on the first week’s results (i.e., average of the first six days of testing), to which will be added daily values as results are received from the laboratory. A rolling average value for any analyte in excess of the relevant action level will be considered an exceedance and the actions described below will be taken. Exceedance of the established levels for each analyte will result in an evaluation of engineering controls and work techniques in the source area. This evaluation shall include but not be limited to the evaluation of work activities that may be causing the exceedance, smoke testing of the critical barriers in question, and inspection and repair of any faulty critical barriers. Exceedance may also result in stoppage of the Work. In addition, the US EPA Region 2 office and the NYCDEP will be notified, in a timely manner, of any exceedance and corrective actions taken.

Table 1. Community Air Monitoring Action Levels Analyte Action Level: Metals

Analyte	Action Level	Basis
Antimony	5 ug/m ³	Antimony has no NAAQS, inhalation RfC or ATSDR inhalation MRL. The Antimony & compounds TLV was used and divided by a 100-fold safety factor to account for longer-term exposure and sensitive individuals
Barium	5 ug/m ³	Barium has no NAAQS. The USEPA Subchronic RfC (USEPA, 1999) was used.
Beryllium	0.02 ug/m ³	Beryllium has no NAAQS. The USEPA Chronic RfC is 0.02 ug/m ³ . The 1 x 10 ⁻⁶ cancer risk level adjusted for 1 year exposure is 0.03 ug/m ³ . Therefore, the chronic RfC was used.
Cadmium	0.04 ug/m ³	Cadmium has no NAAQS or inhalation RfC. The 1 x 10 ⁻⁶ cancer risk level adjusted for 1 year exposure was used.
Chromium (III)	5 ug/m ³	Chromium (III) has no NAAQS, inhalation RfC, or ATSDR inhalation MRL. The chromium (III) inorganic compounds TLV was used and divided by a 100-fold safety factor to account for longer-term exposure and sensitive individuals.
Copper	10 ug/m ³	Copper has no NAAQS, inhalation RfC, or ATSDR inhalation MRL. The copper dusts and mists TLV was used and divided by a 100-fold safety factor to account for longer-term exposure and sensitive individuals.
Lead	1.5 ug/m ³	NAAQS – quarterly average.
Manganese	0.5 ug/m ³	Manganese has no NAAQS. The USEPA Subchronic RfC was used (USEPA, 1999).
Mercury	0.3 ug/m ³	Mercury has no NAAQS. The USEPA RfC was used
Nickel	0.2 ug/m ³	Nickel has no NAAQS or inhalation RfC. The ATSDR Intermediate inhalation MRL was used (ATSDR, 2004).
Zinc	16 ug/m ³	Zinc has no NAAQS, inhalation RfC, or ATSDR inhalation MRL. The zinc oxide TLV (adjusted to account for the weight fraction of zinc) was used and divided by a 100-fold safety factor to account for longer-term exposure and sensitive individuals. The TLV for zinc oxide is 2 mg/m ³ . The atomic weight for zinc is 65.38 and the formula weight for zinc oxide is 81.38. The calculated TLV for zinc oxide measured as zinc is calculated as $(65.38/81.38) \times 2 \text{ mg/m}^3 = 1.606 \text{ mg/m}^3$.

Table 2. Community Air Monitoring Action Levels Analyte Action Level: Particles and Dust

Analyte	Action Level	Basis
Asbestos	0.00028 f/cc	Asbestos has no NAAQS. The 1×10^{-6} cancer risk level adjusted for 1 year exposure was used. Value based on measurement of PCME fibers.
Particulate PM10	150 ug/m ³	NAAQS – 24-hour average
	50 ug/m ³	NAAQS – Annual average
Particulate PM2.5	65 ug/m ³	NAAQS – 24-hour average
	15 ug/m ³	NAAQS – Annual average
Silica (crystalline), as respirable dust	10 ug/m ³	The USEPA determined that lower Manhattan indoor air 95%UCL Background levels for the various forms of crystalline silica were 7.8 – 9.3 ug/m ³ (USEPA, 2003). The action level selected for the project is slightly above this range.

2.5 Study Boundaries

The activities which might result in generation of elevated levels of air contaminants are the abatement of asbestos and COPCs from the Building and subsequent selective demolition of the Building. Additionally off-site industrial, construction and demolition activities in the vicinity, as well as atmospheric transport of air contaminants may have a significant impact on community air monitoring samples. The study is limited to the Building and property boundaries.

2.6 Decision Making Rule

Exceedance of the established levels for each analyte's maximum background reading will result in an evaluation of engineering controls and work techniques in the source area. The evaluation shall include but not be limited to the evaluation of work activities that may cause an exceedance, smoke testing of the critical barriers in question, inspection and repair of any faulty critical barriers, etc.

The US EPA Regional office and the NYCDEP will be notified, in a timely manner, of any exceedance and corrective actions taken of possible source routes from the Building that may be cause for a work stoppage until such time that a resolution has been determined.

2.7 Limits on Decision Errors

The data collected during this project are not intended to serve as the basis of final risk management decision making at any specific residence or location. Rather, the data serve as a preliminary assessment of potential emissions and are used to trigger evaluation of site engineering controls associated with activity at the Site. These preliminary corrective action judgments are triggered at typical air quality background levels and/or USEPA indicated air criteria. Any value exceeding the trigger level will result in the following actions:

- Halt operations at the site
- Verify analytical data
- Investigate the cause of the exceedance
- Correct the problem, if there is one
- Collect additional samples to document current conditions
- Report the data to the pertinent on-site personnel and authorities

Every exceedance will be investigated. Using this definition of error, the level of error requiring an investigation is zero (0) or site operations and engineering controls will be investigated.

3.0 Measurement and Data Acquisition

3.1 Sampling Process and Design

3.1.1 Observations of Visible Emissions

During each work shift of the abatement phase, the environmental consultants will be tasked with observing the Building's exterior containment barriers and exterior envelope. During each shift, established critical barriers and area(s) of high emission potential will be observed to determine that "no visible emission" is occurring. During the selective demolition phase, the environmental consultant will enforce dust suppression measures to avoid dust from crossing boundaries of the site. The Specification for Community Air Monitoring sets forth the details of this obligation.

3.1.2 Air Monitoring

Air monitoring during the abatement phase and selective demolition phase will be conducted as set forth in the Specification for Community Air Monitoring.

3.1.3 Air Sampling and Analysis Methods Requirements

Integrated air samples will be collected by drawing air through a method-specified filter at a specified flow rate for a specified period of time. As described in the Specification for Community Air Monitoring, an equivalent or alternative sampling and analysis method may be substituted by the laboratory or project management for methods contained in the Specification for Community Air Monitoring to improve sampling and analysis results.

If alternative methods to those listed in this QAPP or the Specification for Community Air Monitoring are required to achieve the project objectives, these methods will be reviewed by the Community Air Monitoring Coordinator, Laboratory QA Officer and Project Director, and then the USEPA Region 2 will be contacted for review and concurrence.

3.1.4 Field QA/QC Samples

Pursuant to the Specification for Community Air Monitoring, QA/QC samples will consist of blanks and paired samples generated by a comparison of various real-time monitoring, time weighted laboratory analysis and previously established background levels. Due to the simultaneous operation of multiple real-time air monitors coupled with multiple and sometimes redundant air samples being collected for laboratory analysis from four close site locations, the collection of duplicate samples is not planned. The function of duplicate samples will be served by the comparison of simultaneously collected data.

Where modification of standard sampling or laboratory methodology is required, documentation of the modification will be clearly indicated in field notes or other reports as appropriate. Detailed field notes will record information pertinent to each sample collection. Field notes will be available for review following sample collection.

3.2 Sampling, Handling and Custody Requirements

Documentation of sample collection, handling and shipment will include completion of chain of custody forms in the field, use of field logs, and entry of data into a field computer. Each sample will be labeled with a unique sample identifier.

A chain-of-custody form will accompany every shipment of samples to the analytical laboratory. The purpose of the chain of custody form is to establish the documentation necessary to trace possession from the time of collection to final disposal. Minimally, the chain of custody form will have the following information:

- Project number
- Sampler's signature
- Date and time of sample collection
- Sample identification number

The shipping forms or a letter of transmittal sent with the samples will describe:

- Number of containers
- Sample preservative (N/A)
- Date and time of sample shipments

The receiving laboratory(s) will enter the following information upon receipt:

- Name of person receiving the sample
- Date of sample receipt

- Sample condition

All corrections to the chain of custody record will be initialed and dated by the person making the corrections. Each chain of custody form will include signatures of the appropriate individuals indicated on the form. The originals will accompany the samples to the laboratory, and copies documenting each custody change will be recorded and kept on file. Chain of custody will be maintained until final disposition of the samples by the laboratory and acceptance of analytical results by the client. One copy of the chain of custody will be kept by field personnel.

All documentation, including sample container labels, chain of custody forms, custody seals and shipping forms will be fully completed in ink (or printed from a computer). Shipping from the site to laboratory will be via overnight delivery.

Upon receipt, samples will be given to the laboratory sample custodian. The sample package will be opened and the contents inspected. Chain of custody forms will be reviewed for completeness. Samples will then be logged and assigned a unique laboratory sample number. Any discrepancies in samples will be noted.

3.3 Analytical Methods and Requirements

The most appropriate analytical methods for each environmental medium may depend on the type and level of contamination, interferences as well as the required level of detection. For these reasons all potential modifications for methods may not specified at this time.

3.3.1 Communications

Lines of communication between project personnel and project management staff will be appropriate to enable timely response to events that have the potential to affect public health and quality of data. Project personnel are provided with a project contact list that includes telephone numbers for both routine communications and emergency notifications.

Communications also entail ensuring that information on sample collection, transportation, analysis, and storage; data acquisition, analysis, and reporting personnel assignments and activities, and other information pertinent to the project are distributed to potentially affected personnel in a timely manner.

Changes in procedures, equipment, personnel, or other program elements as a result of an accident or emergency that have the potential to affect data quality or achievement of overall program objectives will be communicated to the Project Managers in writing in a timely manner. Copies of all written communications and written summaries of all substantive telephone conversations will be placed in a permanent project file maintained by the site supervisors.

3.3.2 Custody Procedures

Custody is one of several factors which are necessary to document the history of the samples. Sample custody is addressed in three parts: field sample collection,

laboratory analysis, and final evidence files. Final evidence files, including originals of all laboratory reports and purge files, are maintained under document control in a secure area. A sample is under custody if:

- The item is in actual possession of a person.
- The item is in the view of the person after being in actual possession of the person.
- The item was in actual physical possession and subsequently secured to prevent tampering.
- The item is in a designated and identified secure area.

3.3.3 Field Custody Procedures

Field logbooks and automated data-loggers will provide the means of recording data collection activities performed during the project. Field logbooks will be bound field survey books or notebooks. The project specific identification number should identify each logbook. The title page of each logbook will contain the following:

- Person to whom the logbook is assigned
- Project name
- Project start date and end date

Entries into the logbook will contain a variety of information. Each daily entry, the date, start time, weather, names of team members present, level of personal protection equipment (PPE) being used, and the signature of the person making the entry will be entered. The names of visitors to the site, field sampling or investigation team personnel and the purpose of their visit will also be recorded in the field logbook.

Measurements made and samples collected will be recorded. All entries will be made in permanent ink, signed, and dated. No erasures will be made. If an incorrect entry is made, the information will be crossed out with a single strike mark, which is signed and dated by the sampler. The number of photographs taken of the station, if any, will also be noted. All equipment used to make measurements will be identified, along with the dates or certificates of calibration.

Sampling and air monitoring will follow procedures documented in the Specification for Community Air Monitoring. The equipment used to collect samples will be noted, along with the time of sampling, sample description, volume and number of containers. Sample identification numbers will be assigned prior to sample collection. Any duplicate samples will receive an entirely separate sample identification number, and duplication will be noted under the sample description.

3.3.4 Sample Shipping

Shipment procedures summarized below will ensure that the samples will arrive at the laboratory with the chain of custody intact.

- The field sampler is personally responsible for the care and custody of the samples until they are transferred or properly shipped. As few people as possible will handle the samples.
- All sample containers will be identified by the use of sample tags with samples number, sampling location, data/time of collection, and type of analysis or a bar code traceable to these parameters.
- Sample labels will be completed for each sample using waterproof ink.
- Samples will be accompanied by a properly completed chain of custody form. The sample numbers will be listed on the chain of custody forms. When transferring the possession of samples, the individuals relinquishing or receiving sign, date and note the time of the exchange. The chain-of-custody documents transfer the custody of samples from the sampler to another person or to/from a secure storage area.
- Shipping containers should be locked and secured with strapping tape and custody seals for shipment to the laboratory.

3.3.5 Laboratory Custody Procedures

When the laboratory receives samples, the sample custodian examines each custody seal to verify they are intact and the integrity of the environmental samples has been maintained. The sample custodian then signs the chain of custody document. The sample custodian examines the contents of the sample shipping container. Sample container breakages or discrepancies between the chain of custody document and sample labels are recorded. All problems or discrepancies noted during this process are to be reported to the laboratory project manager. Inter-laboratory chain of custody procedures and specific procedures for sample handling, storage, disbursement for analysis, and disposal will be followed as per the laboratory's SOPs and/or QA plan.

3.3.6 Final Data Files

The final data file will be the central repository for all documents which constitute evidence relevant to sampling and monitoring activities. RJ Lee Group is the custodian of the data files and maintains all relevant records, reports, logs, field notebooks, pictures, subcontractor reports and data reviews in a secured, limited access area. The final evidence file may include at a minimum:

- Field logbooks
- Field data and data deliverables
- Photographs

- Drawings
- Laboratory data deliverables
- Data review reports
- Data assessment reports
- Progress reports, QA reports, interim project reports
- Custody documentation

3.3.7 Internal Quality Control Checks

QC procedures and checks are used to verify the precision and accuracy of analytical data. Field QC checks are used to identify potential problems associated with sample handling and procedures. Laboratory QC checks are used to identify problems associated with sample preparation and analysis.

3.3.8 Field Quality Control Checks

To check the quality of data from field sampling efforts, blank samples will be collected for analysis.

3.3.9 Laboratory Quality Control Checks

Each laboratory will have a QC program to ensure the reliability and validity of the analysis performed at the laboratory. The internal QC checks differ slightly for each individual procedure but in general the QC requirements may include the following:

- Method and analytical blanks – These blanks are processed using the same reagents and procedures and at the same time as the samples being analyzed. Contamination found in these blanks would indicate that similar contamination found in associated samples may have been introduced in the laboratory and not actually be present in the samples.
- Instrument blanks – These blanks are analyzed at the beginning, intervals during, at the end of an analytical sequence to assess contamination and instrument drift.
- MS/MSDs Matrix Spikes (MS) are prepared by placing a known quantity of analytes in sample media. The MS is then processed in the usual manner. Percent recoveries of the spiked compounds or analytes reflect the ability of the laboratory and method to accurately determine the quantity of that analyte in that particular sample (i.e., is a measure of accuracy in the specific sample matrix).
- Surrogate spikes – Surrogate spikes are added before sample extractions for organic analyses. Surrogate spikes aid the analyst in determining matrix effects on recovery of compounds in each sample.

- Laboratory duplicates or MS/MSD duplicates – These duplicates are conducted by the laboratory to determine precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis.
- Laboratory Control Standards (LCS) – LCS samples consist of known amounts of analytes and are prepared and analyzed concurrently with project samples. The recovery of analytes or compounds in these samples provides a measure of method accuracy in the absence of matrix effects.
- Internal standards are used to ensure that instrument sensitivity and response are stable during each sample analysis.
- GC/MS instrument performance checks – Instrument performance checks are performed to ensure mass resolution, identification, and sensitivity.

All data obtained will be properly recorded. The laboratory will reanalyze any samples analyzed in nonconformance with the QC criteria, if sufficient volume is available.

4.0 Instrument Calibration and Frequency

Laboratory methods and any corresponding SOPs identify the minimum requirements to be met by the laboratory performing the analysis, to meet adequate instrument calibration frequency, and QA/QC for raw data and reports.

4.1 Field Instrument Calibration

Field sampling and monitoring equipment fall into three categories: those calibrated prior to each use, those calibrated at the factory and those calibrated on a scheduled periodic basis. Frequency of calibration will be based on the type of equipment and manufacturer's recommendations, values given in national standards, the intended use and experience.

Equipment will be calibrated using reference standards (e.g., NIST) or other industry accepted standards. If national standards do not exist, the basis for calibration will be documented. Field equipment calibration will be performed as described by the equipment manufacturer. Calibrated equipment will be uniquely identified by using the manufacturer's serial number or other means.

Scheduled periodic calibration of testing equipment will not relieve field personnel of the responsibility to verify that equipment is functioning properly. If an individual suspects an equipment malfunction they will remove the device from service, tag it so that it is not used, and notify the site supervisor so that recalibration can be performed or a substitute obtained. Instruments in use that are past due for calibration will be immediately calibrated.

Table 3. Field Instrument Calibration and Zero Check

Device	Calibrator	Frequency
Personal Pumps	Bubble meter, dry cal or rotometer	Before each use
Hi-volume Personal Pumps	Bubble meter, dry cal or rotometer	Before each use
MetOne 9012 Particulate Analyzer	Calibrated at Factory annually	At factory and initial and weekly electronic zero check. Comparison to BAM an TEOM results
BAM or TEOM	Factory supplied calibrator	Annual factory calibration. Initial calibration at the start of monitoring, then quarterly calibration checks.

4.2 Laboratory Instrument Calibration

Calibration procedures for specific laboratory instruments vary and may consist of initial calibrations (3 or 5 points), initial calibration verifications and continuing calibration verifications depending on the instrument. SOPs are established within the laboratory for all analytical and administrative procedures. The SOP for each analysis performed in the laboratory describes the calibration procedures, frequency, acceptance criteria and the conditions that will require recalibration.

The laboratory maintains a sample log for each instrument which will contain the following information: instrument identification, serial number, date of analysis, analyst, calibration data and the samples associated with specific calibrations.

4.3 Calibration Failures

Equipment that fails calibration or becomes inoperable during use will be removed from service, tagged to indicate that it is out of calibration, and segregated to prevent inadvertent use. Such equipment will be repaired and recalibrated or replaced as appropriate.

Results of activities performed using equipment that has failed recalibration will be evaluated by the laboratory manager. If the activity results are adversely affected, the results of the evaluation will be documented and the appropriate personnel notified.

Records will be prepared and maintained for each calibrated measuring and testing instrument and for each reference standard to demonstrate that calibration procedures are traceable. Calibration records will include as appropriate:

- Type and identification number of equipment
- Calibration frequency and acceptable tolerances
- Identification of calibration procedure used;

- Calibration dates
- Identification of individual(s) and/or organizations performing the calibration
- Reference standards used for each calibration
- Calibration data
- Certifications or statements of calibration provided by manufacturers and external agencies, and traceable to national standards
- Information on calibration acceptance or failure.

General calibration requirements include the following:

- All adjustable, mechanical, electronic and/or recording instruments will be calibrated prior to entry into the field
- Instruments that cannot be readily calibrated (Met One Model 9012 Particle Counters) will be performance checked against a similar instrument (BAM or TEOM) with known performance. If the performance of the instrument varies by more than +/- 10% the data may be subjected to a correction factor.
- Instruments that require frequent calibration checks or calibration during use will be calibrated as specified in their operating manuals.

4.3.1 Maintenance

Each piece of equipment used in activities affecting data quality will be maintained according to specifications provided by the manufacturer. The site supervisor will be responsible for routine maintenance and will have available tools and spare parts to conduct routine maintenance. If the equipment or instrument cannot be maintained to manufacturer's specifications or cannot be properly calibrated, it will be returned to the manufacturer or repair facility for proper maintenance and repair. Once returned from the manufacturer, the instrument will be checked for compliance with project specifications before being used. Logs will be kept detailing maintenance records for field equipment and instrument calibration data.

5.0 Assessment Oversight

5.1 Assessments and Response Actions

The Assessments and Response Actions will be according to the Specification for Community Air Monitoring. The Environmental Consultant's shift supervisor will oversee and inspect daily sampling activities. If visual observations or instrument readings, verified by multiple instruments, indicate an exceedance of established site air quality standards the shift supervisor will immediately notify a senior project environmental, health and safety officer, evaluate engineering controls and take appropriate corrective action.

The EPA and NYCDEP will be notified in a timely manner of any site air quality standard exceedance and the associated corrective action. Response actions are contained in the Specification for Community Air Monitoring.

6.0 Data Review

Data review and validation will consist of establishing screening criteria, and appropriate statistics for each parameter, describing methods for determining the disposition of suspect data, and documenting final disposition of invalid or qualified data, including outliers. No formal exclusion range for data values is established. Monitoring results in excess of Site Trigger Levels will be closely examined and validated by a data review and technical oversight group and acted upon if valid.

Test Statistic: Data will be reviewed and validated in accordance with the requirements of the referenced method. Quantitative professional judgment and sound scientific methodology will be used to determine fiber counts and other analysis results in sampled media. The need for corrective action will be assessed based upon professional judgment supported by instrument and laboratory analysis. Corrective action will be determined by the Environmental Consultant in consultation with, as required, site contractors, project management and regulatory agencies.

Out-of-range data may not be excluded from the validated data set unless the appropriate data value and root cause can be positively established and documented. The data collected during this project are not intended to serve as the basis of final risk management decision-making at any specific residence or location. Rather the data serves as a preliminary assessment of potential emissions that is used as trigger for evaluation of engineering controls associated with site activity.

Suspect data or samples are examined in detail, including any irregularities in its collection and handling. In the absence of any clear indication of invalidity (e.g., equipment failure or operator error), data outliers will remain in the validated data set but will be flagged as outliers per specified criteria (e.g., $>3 \times$ standard deviation) from previously established background levels). Valid high data values should include comments in the daily log to indicate activities that may have caused the value. Data points determined to be invalid will be flagged in a clear and consistent manner in the original raw data set and removed from subsequent data summaries and files.

QA for data review will ensure that the screening criteria monitoring is comprehensive, unambiguous, reasonable, and internally consistent; and that data review activities are properly documented. Data discrepancy reports should be prepared describing any data problems observed and any data correction activities undertaken.

Calibration adjustments and adjustments to reduce data to standard conditions for comparability will be clearly documented, and raw data clearly distinguished from "corrected" data (i.e., data to which calibration and standardization adjustments have been applied).

Raw data and adjustments are entered into a computer database, field notes and/or spreadsheet for correction, statistical analysis, formatting, and summarizing to reduce the potential for human error.

7.0 Data Reduction, Review, and Reporting

All data generated through field activities or by the laboratory operation shall be reduced and reviewed prior to reporting. The laboratory shall disseminate no data until it has been subjected to the following procedures.

Data reporting consists of communicating summarized data in a final form. Quality assurance for reporting consists of measures intended to avoid or detect human error and to correct identified errors. Such methods include specification of standard reporting formats and contents of measures to reduce data transcription errors.

Data will undergo peer review by qualified reviewers capable of evaluating reasonableness of the data for the scientific design and data quality.

Reports: A report of all the summary study design characteristics, sample collections and analyses, data quality and results shall be presented by the analytical laboratories.

7.1 Field Data Reduction Procedures

All field data will be written into field logbooks immediately after measurements are taken. If errors are made, results will be legibly crossed out, initialed and dated by the field member, and corrected in a space adjacent to the original (erroneous) entry. Sampling data and measurements field logs include PDA data and air sampling data sheets.

7.2 Laboratory Data Reduction Procedures

Laboratory data reduction procedures will include the following protocol. All raw analytical data will be logged. Data recorded will include pertinent information, such as the sample identification number and the sample label number. Other details will also be recorded such as the analytical methods used, name of analyst, data of analysis, matrix samples, reagent concentrations, instrument settings, and the raw data. Copies of any strip chart printouts (e.g., gas chromatograms) will be maintained on file. Periodic review of the data logs by the laboratory project manager takes place prior to final data reporting.

For most analyses, data reduction involves the comparison of samples to a standard reference curve. Samples must be analyzed within the concentration range of the

calibration curve. For this project, constituents of interest must be analyzed and reported within an appropriate concentration range to report the detected concentrations of all constituents of interest, or reported as not detected at the Target Air Quality Level (TAQL). This may require the laboratory to prepare, analyze, and report the results from more than one dilution. Non-detected values above the TAQL of the analytical method are unacceptable unless due to matrix interference. If a constituent concentration is not detected at the TAQL, the laboratory will compare the raw data to the method detection limit (MDL) or instrument detection limit (IDL).

Results are calculated from the raw data using the formula given in the method. The laboratory project manager, at the conclusion of each operating day, checks all calculations. Errors and corrections are to be noted.

QC data such as laboratory duplicate and surrogates will be compared to the method acceptance criteria. Data considered to be acceptable will be entered into the laboratory computer system. Data summaries will be sent to the laboratory project manager for review. If approved, data are logged into the project database format. Unacceptable data shall be appropriately qualified in the project report. Case narratives may be prepared which should include information concerning data that fell outside acceptance limits and any other anomalous conditions encountered during sample analysis.

7.3 Data Review

Data review will include reviews of all technical holding times, instrument performance check sample results, initial and continuing calibration recoveries, blank results, surrogate spike recoveries, MS recoveries, target compound identification and quantification. In summary, the data evaluation process is a three-tiered process involving the following steps:

- Tier I: The data package is checked for completeness. The sample results are evaluated to assess potential usability issues.
- Tier II: The results of the QC checks, analytical procedures and sample results are assessed and applied to the data set.
- Tier III: The raw data are examined in detail to check for calculation, compound identification, and/or transcription errors.

Completeness checks will be administered on all data to determine whether deliverables specified in the QAPP are present. The reviewer will determine whether all required items are present and request copies of missing deliverables.

7.4 Field Data Reporting

Field data reporting shall be conducted principally through the transmission of report sheets containing tabulated results of all measurements made in the field and documentation of all field calibration activities.

7.5 Laboratory Data Reporting

Upon analyses completion the laboratory shall issue a report of analyses for each sample. Upon completion of the report, final review will be conducted of the report summaries and case narrative to determine whether the report meets project requirements. In addition to the record of chain of custody, the report format should include of the following:

- Date of issuance
- Laboratory analysis performed
- Any deviation from intended analytical methodology
- Laboratory ID number (if applicable)
- Numbers of samples and respective matrices
- Laboratory report contents
- Project name and number
- Discussion of technical problems or other observations which may impact analytical results including any QC checks which failed
- Signature of laboratory project manager
- Cross referencing of laboratory sample to project sample identification
- Description of any data qualifiers to be used
- Sample preparation and analyses references for samples
- Sample results

8.0 Performance Audits

Performance and system audits may be conducted during any environmental investigation. These audits may be performed on the laboratory as well as field activities. Audits shall be documented and maintained by the project manager or designee performing the audit.

8.1 Laboratory Performance Audits

Laboratory performance audits may be administered by the Quality Assurance Officer and/or third party laboratory certification agencies on an annual or shorter basis. The Environmental Consultant verifies that annual audits are made by ensuring that the laboratory performing analysis is currently certified by the listed agencies. The audit samples should be used to monitor accuracy and identify and resolve problems in sample preparation and analysis techniques which lead to the generation of nonconforming data. The laboratory performance audits include verification of each analyst's record keeping, proper use and understanding of

procedures, and accuracy evaluation. Corrective action will be taken for any performance failure noted.

8.2 Field Performance Audits

A consultant, designee or internal data review group, shall perform field performance audits of the field sample team on a monthly basis at a minimum. If a nonconformance is found in the evaluation of field data, corrective action will be taken to resolve the issue. Corrective actions will be noted in field logs and/or electronic logs.

9.0 Preventive Maintenance

9.1 Field Instrument Preventive Maintenance

Field instruments will be checked and calibrated daily before use. Calibration checks will be documented on the Field Calibration log sheets. Critical spare parts such as tape and batteries will be kept on-site to reduce potential downtime. Backup instruments and equipment will be available on-site or within one-day shipment to avoid delays in the field schedule.

9.2 Laboratory Instrument Preventive Maintenance

Designated laboratory employees regularly perform routine scheduled maintenance and repair of all instruments. All maintenance that is performed is documented in the laboratory's operating record. All laboratory instruments are maintained in accordance with manufacturer's specifications.

10.0 Procedures to Evaluate Data Precision and Accuracy

Data will be reviewed for indications of interferences to results caused by site external sources, sample matrices issues, cross contamination during sampling and transport/storage anomalies.

10.1 Accuracy Assessment

Accuracy is similarly assessed by determining percentage of response (%R) for surrogate compounds added to a field and/or QC sample to be analyzed. Accuracy for the metals analysis may be further assessed through determination of %Rs for LCSs and MS samples.

Percent recovery for MS/MSD results is determined according to the following equation:

$$\%R = [(\text{Amount in Spiked Sample} - \text{Amount in Sample}) / \text{Spike amount added}] \times 100$$

%R for LCS and surrogate compound results is determined according to the following equation:

$$\%R = [(\text{Experimental Concentration} / \text{Spike amount added})] \times 100$$

10.2 Precision Assessment

The relative percent difference (RPD) between the MS and MSD for organics, sample and sample duplicate for inorganics, and field duplicate pair is calculated to compare to precision objectives and plotted. The RPD is calculated according to the following formula.

$$\text{RPD \%} = [(\text{Amount in Sample 1} - \text{Amount in Sample 2}) / 0.5 (\text{Amount in Sample 1} + \text{Amount in Sample 2})] \times 100$$

10.3 Completeness Assessment

Completeness is the ratio of the number of valid sample results to the total or possible number of samples analyzed. Following completion of the analytical testing, the percent completeness will be calculated by the following equation:

$$\text{Completeness} = \frac{(\text{number of valid measurements})}{(\text{number of measurements planned})} \times 100$$

11.0 Corrective Action

Corrective action is the process of identifying, recommending, approving and implementing measures to counter unacceptable procedures or out of QC performance which can affect data quality. Corrective action can occur during field activities, laboratory analyses, data review, and data assessment. All corrective action proposed and implemented should be documented in the QA reports to management. Corrective action should only be implemented after approval by a project manager or his designee. If immediate corrective action is required, approvals secured by telephone from the project manager should be documented in an additional memorandum.

For noncompliance problems a formal corrective action program will be determined and implemented at the time the problem is identified. The person who identifies the problem is responsible for notifying the project manager.

Any nonconformance with the established QC procedures in the QAPP or the Specification for Community Air Monitoring will be identified and corrected in accordance with the QAPP. The project director or his designee will issue a nonconformance report for each of the identified nonconformance conditions.

11.1 Field Corrective Action

Corrective action in the field may be needed when the sample network is changed or sampling procedures and/or field analytical procedures require modification and unexpected conditions. In general the site team may identify the need for corrective action. The site staff in consultation with the Site supervisor will recommend a corrective action. The project manager or designee will approve the corrective measure which will be implemented by the site team. It will be the responsibility of the project manager or designee to ensure the corrective action has been implemented.

Corrective action resulting from internal field audits will be implemented immediately if data may be adversely affected due to unapproved or improper use of approved method. The project manager or designee will identify deficiencies. Implementation of corrective actions will be performed by the site team. Corrective action will be documented in QA reports to the entire project team.

Corrective actions will be implemented and documented in the field log. No staff member will initiate corrective action without prior communication of findings through the proper channels.

11.2 Laboratory Corrective Action

Corrective action in the laboratory may occur prior to, during and after initial analyses. A number of conditions such as broken sample containers, damaged samples, and potentially high concentration samples may be identified during sample log-in or just prior to analysis. Following consultation with laboratory analysts and section leaders, it may be necessary for the laboratory QA manager to approve the implementation of correction action. The following conditions during or after analysis may automatically trigger corrective action: dilution of samples, additional sample extract cleanup, automatic re-injection/reanalysis when certain QC criteria are not met. The bench chemist will identify the need for corrective action. The laboratory manager in consultation with the staff will approve the required corrective action to be implemented by the laboratory staff. The laboratory QA manager will ensure implementation and documentation of the corrective action. If the nonconformance causes project objectives not to be achieved it will be necessary to inform all levels of project management to concur with the corrective action.

These corrective actions are performed prior to release of the data from the laboratory. The corrective action will be documented in both the laboratory corrective action log. If corrective action does not rectify the situation the laboratory will immediately contact the project manager or his designee.

11.3 Data Review and Data Assessment Corrective Action

The need for corrective action may be identified during data review or data assessment. Potential types of corrective action may include re-sampling by the field team or re-injection/analysis of samples by the laboratory.

If review identifies a corrective action situation it is the project manager who will be responsible for approving the implementation of corrective action, including re-sampling, during data assessment.

12.0 Quality Assurance Reports to Management

12.1 Laboratory Quality Assurance Reports to Management

The laboratory QA plan must require periodic reporting to management on the effectiveness of quality systems, performance of measurement systems and data quality.

12.2 Project Quality Assurance Reports to Management

The RJLG project director or designee may review issues that could adversely affect the achievement of project objectives. The review may include but not limited to:

- Laboratory and field data quality
- Laboratory and field audits
- Major problems encountered for each site and the corrective measures taken to prevent recurrence
- Significant recurring problems or trends, which may require global correctable measures
- Recommended or ongoing solutions to issues uncovered during central management review.

13.0 Appendix: Methodologies

Sample analysis conducted using industry standard analytical laboratory methods as follows:

- Asbestos using transmission electron microscopy (TEM) in accordance with NIOSH 7402, AHERA, ASTM D-5755.
- Metals in accordance with NIOSH 7300 method, using inductively coupled argon plasma (ICP) spectrometry.
- Particle characteristics using scanning electron microscopy (SEM), coupled with energy dispersive spectroscopy (EDS) techniques.
- Silica using X-ray Diffraction (XRD) in accordance with NIOSH 7500 and NIOSH 0600 methods.

14.0 Appendix: Laboratory Certifications

Asbestos				Chemistry				
	PLM	PCM	TEM	Potable/ Drinking Water	Non- Potable/ Wastewater	Solid/ Hazardous Waste	Lead ³	Other ⁴
AIHA	✓	✓	✓				✓	✓
(NVLAP)	✓		✓					
New York ELAP (NELAC)	✓		✓ ^{1,2}	✓	✓	✓		
Pennsylvania (DEP) (NELAC)				✓	✓	✓		
California ELAP	✓		✓ ^{1,2}	✓	✓	✓		
Connecticut	✓	✓	✓ ^{1,2}	✓				
Louisiana	✓	✓	✓ ¹		✓	✓	✓	✓
Maryland				✓				
Montana				✓				
Oregon ELAP			✓ ^{1,2}	✓	✓	✓		
Virginia	✓	✓	✓ ²	✓				
Washington				✓	✓	✓		✓
West Virginia	✓	✓	✓ ¹					

¹TEM Air

²TEM Drinking Water

³Paint Chips, Wipes, and/or Soils

⁴Metals, Silica, Organic Solvents, Diffusive Samples, Environmental, TCLP, Air and Emissions

Licenses

State of Washington Radioactive Materials License

US Department of Agriculture Quarantined Soil Permit

US Department of the Treasury Alcohol and Tobacco Tax and Trade Bureau –
Analysis of Wine for Purposes of Export

15.0 Appendix: Glossary

Quality Control Methods

Quality control methods will include both field and laboratory components. Field personnel may prepare two types of quality control samples: replicates and blanks.

Replicates

For air samples, replicates are defined as separate samples that are collected using separate air pumps and filters. These air samples are collected side-by-side at a location and are sampled for the same amount of time. Air pumps are set at the same air flow rates so that adequate and like air volumes are passed through each filter. Replicate samples will not be collected for any media other than air.

Blanks

Field personal will prepare blank samples for air and dust by labeling unused filter cassettes and submitting them for analysis. The laboratory and its staff will have the responsibility for processing all samples submitted according to the specific protocols for sample custody, analysis, reporting, and associated laboratory QA/QC.

Precision

Precision is a measure of the degree to which two or more measurements are in agreement.

Field Precision

Field precision for real-time particulate monitors is assessed through the collection of co-located samples followed by laboratory analysis and comparison to data of co-located USEPA method reference monitors.

Laboratory Precision

For organic (dioxin) analysis, laboratory analyses shall be assessed through matrix spike (MS) samples.

Sensitivity

Sample matrices and abundant contamination often affect quantification limits of sample analyses. Sample/extract cleanups will be performed, if appropriate, to ensure that quantification limits are met. If the specified quantification limits cannot be achieved, the laboratory QA officer, laboratory project manager, and project manager or designee will assess the usability of the data with regard to the project objectives.

Accuracy

Accuracy is the degree of agreement between an observed value and an accepted reference or true value.

Field Accuracy

Accuracy in the field is assessed through the use of blanks and through adherence to all sample handling, preservations, and holding times.

Laboratory Accuracy

Laboratory accuracy may be assessed through the analysis of method blanks, matrix spike/matrix spike duplicate (MS/MSD and LCS/ICSD) analyses, laboratory control samples (LCSs), surrogate compounds, internal standards, and Performance Evaluation samples (PEs). Laboratory duplicates (for metals) will be analyzed at a minimum frequency of 5% (one in 20) or one sample per batch.

Completeness

Completeness is a measure of the amount of valid data obtained from a measurement system compared to the maximum number expected to be obtained under normal conditions.

Field Completeness

Field completeness is a measure of the amount of valid measurements obtained from all the measurements taken in the project. The field completeness goal for this project is 90% for parameters subject to laboratory analysis

Laboratory Completeness

Laboratory completeness is a measure of the amount of valid measurements obtained from all the measurements taken in the project. The laboratory completeness goal for this project is 90% for all samples submitted.

Representativeness

Representativeness expresses the degree to which data accurately and precisely represents a characteristic of population and parameter variations at a sampling point, a process condition, or an environmental condition within a defined spatial and/or temporal boundary.

Measures to Ensure Representativeness of Field Data

Representativeness is dependent upon the proper design of the sampling program and will be satisfied by ensuring that the work plan is followed and that proper sampling techniques are used.

Measures to Ensure Representativeness of Laboratory Data

Representativeness in the laboratory is ensured by using the proper analytical procedures, appropriate methods, meeting sample holding times, and analyzing and may be assessed using field duplicate samples.

Comparability

Comparability is an expression of the confidence with which one data set can be compared to another.

16.0 Appendix: Program Contact Information

Title	Name	Company	Contact Information
Owner Representative	Christopher Colbourne	Masterworks Development Corporation	56 West 45th Street, 4th Floor New York, NY 10036
Project Director	Dave Crawford	RJ Lee Group, Inc.	350 Fifth Avenue, Suite 5820 New York, NY 10118 Phone: (212) 613-2700 Fax: (212) 613-2701 Cell: (412) 979-3081
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Site Hygiene Manager	Dr. Bobby Gunter	RJ Lee Group, Inc.	350 Fifth Avenue, Suite 5820 New York, NY 10118 Phone: (212) 613-2700 Fax: (212) 613-2701 Cell: (267) 342-0562 Home: (215) 489-9391
Environmental Investigation Site Safety Manager and Community Air Monitoring Coordinator	Matthew Zock	RJ Lee Group, Inc.	350 Fifth Avenue, Suite 5820 New York, NY 10118 Phone: (212) 613-2700 Fax: (212) 613-2701 Cell: (917) 674-1810
Site Supervisor	David Sundell	RJ Lee Group, Inc.	350 Fifth Avenue, Suite 5820 New York, NY 10118 Phone: (212) 613-2700 Fax: (212) 613-2701 Cell: (917) 674-1737
Quality Assurance Officer	Dr. Charles Kraisinger	RJ Lee Group, Inc.	350 Fifth Avenue, Suite 5820 New York, NY 10118 Phone: (724) 325-1776 Fax: (724) 733-1799 Cell: (724) 516-0750
Construction Manager	Lech Gorecki	Laval Construction Corporation	1123 Broadway, Suite 807 New York, New York 10010 Phone: (212) 645-2825 Fax: (212) 645-2826 Cell: (917) 559-6706 Home: (212) 348-6989
Contractor Safety Officer	Frank Ferrara	Laval Construction Corporation	1123 Broadway, Suite 807 New York, New York 10010 Phone: (212) 645-2825 Fax: (212) 645-2826 Cell: (516) 987-4191
Contractor	Todd Grant	Nova Development Group, Inc.	189 Townsend St. New Brunswick, NJ 08901 Phone: (732) 565-3655 Fax: (732) 565-3654 Cell: (732) 672-8555